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# PLANT & PEST ADVISORY

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A RUTGERS COOPERATIVE EXTENSION PUBLICATION

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## IPM Update

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

### Sweet Corn

**European corn borer (ECB)** adult catches remain low across much of the state at this time. The highest average catches at this time are in Cumberland County (see ECB Map), and this increase may signify the onset of a new flight. ECB injury may be found in whorl and pre-tassel stage sweet corn at this time, as larvae have hatched from eggs and are feeding on corn. 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:

Shirley	6	Downer	1	Newton	1
Burlington	1	Farmingdale	1	Oldwick	1
Califon	1	Hammonton	1	Philipsburg	1
Chester	1	Milford	1	Princeton	1

**Corn earworm moth (CEW)** catches have increased dramatically in much of the state. Highest catches may be found in parts of Morris, Cumberland and Cape May counties (see CEW Map). The current population may be in part the result of wind-aided movement from the south. As such, when southerly currents dominate again, we may have further increases. These moths are a serious threat to the 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. Begin silk spray schedules as close to first silk as possible.

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

Denville	15	Downer	8	Phillipsburg	7
Green Creek	14	Medford	8	Princeton	7
East Vineland	12	Griggstown	7	Flanders	6
New Egypt	9	Pedricktown	7	Morristown	6

Silking Spray Schedules\*:

South – 3 days

Central – 3 days

North – 3 days

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

Scattered **fall armyworm (FAW)** infestations continue to occur throughout the state. This pest favors whorl stage corn, and will even infest seedlings, causing significant injury to small plants. While scouting for ECB, note the presence of larger holes than are typically caused by ECB. These may be accompanied by large amounts of droppings in the whorl. FAW larvae are green with a pale stripe on each side when very small. As they grow, they take on a tan and brown color with a prominent upside-down “Y” on the head capsule. This pest may be difficult to control with commonly used pyrethroid insecticides. Newer materials generally provide better control. See the *2012 Commercial Vegetable Production Recommendations* for newer materials useful in controlling FAW. Consider treating if 12% or more plants are infested with FAW either alone, or in combination with ECB.

## Peppers

Larval ECB infestations continue in some pepper fields at this time, although most of these are not new. An infestation is sometimes indicated by an increase in soft rotted fruit. New egg laying should not be occurring at significant levels now, but may increase again with the onset of a late season flight. If 2 or more eggmasses are found in a 50 plant sample (2 leaves/plant), a foliar insecticide application should be considered. 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. There has been a slight decrease in **beet armyworm (BAW)** moth catches in southern NJ pheromone traps over the past week (see BAW map), although catches are still high in some areas. This pest is typically a threat to peppers, and growers should intensify scouting efforts at this time. BAW larvae feed on leaves near the growing points on plants, resulting in noticeable foliar injury in the upper canopy prior to fruit damage occurring. BAW larvae are typically green in color, with a prominent black spot behind the head on either side of the body. In recent years, BAW infestations have occurred on peppers as far north as Warren County. 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 have declined again throughout the state. At present, the highest catches are from Hunterdon County and the Cumberland-Gloucester border areas (see BMSB map). BMSB injury on peppers and tomatoes continues at low levels in research plots at the Snyder Farm in Hunterdon County, and in the north and central counties. Nymphs and adults have been found in these areas as well. Stinkbug feeding has the appearance of a large, diffuse blotch on pepper and tomato fruit. The blotch, called “cloudy spot”, has scalloped edges, and is pale on green fruit, but turns bright yellow as fruit ripens. BMSB has shown a preference for peppers in the past. It would be wise to intensify field scouting at this time. The bugs are difficult to detect in the field, however, and first signs of increase may appear in harvested fruit. If injury to fruit is appearing with greater frequency, consider treating for stinkbugs. For materials useful against stinkbugs, see the *2012 Commercial Vegetable Production Recommendations*.

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

Pedricktown	16	Jones Island	6	Griggstown	5
Snyder Farm	13	Phillipsburg	6	South Branch	5
Oldwick	11	Shirley	6	Woodstown	5
Shiloh	10	Belvidere	5	Califon	4

## Tomatoes

Recent rain events have increased the incidence of bacterial infections in tomatoes. Wind-driven rain spreads the cells of **bacterial leaf spot (BLS)** and related pathogens. It is wise to apply a copper product to affected plantings as soon as conditions permit. Watch plants for signs BLS, including dark lesions on all foliage (even the youngest leaves) and fruit. Consult the *2012 Commercial Vegetable Production Recommendations* for anti-bacterial materials and application schedules.

Several fields and high tunnels in Somerset and Hunterdon counties have developed infestations of **tomato pinworm**. This pest is a very small caterpillar that initially mines the leaves. As they grow larger, the larvae leave the leaves and penetrate tomato fruit underneath the calyx. Initial infestations may be identified by leaf mines that are much more extensive than individual mines caused by the vegetable leaf miner. It is quite unusual for us to have this pest in New Jersey, as it is commonly found well to our south. The action threshold for this pest is 0.5 mines per complete leaf, and so far, our infestations are not close to this threshold. Growers who have used Coragen through the drip for management of other caterpillar pests will not see injury from pinworm.

## **Pumpkins and Winter Squash – DOWNY MILDEW NOW PRESENT!**

**Downy mildew (DM)** has been found on pumpkins from Middlesex County northward through Hunterdon County. This disease can defoliate fields rapidly under wet conditions. Symptoms include pale areas, sharply bordered by leaf veins on the upper leaf surface. Below these areas (lower leaf surface), dark spores are produced. Without control, particularly if conditions are moist, the lesions will coalesce, resulting in total defoliation of the plants in a period of several days. For more information on the regional presence of DM as well as comprehensive, weekly forecasts, see the following website: <http://cdm.ipmpipe.org> DM requires the addition of specific fungicide products to the regular protectant program. See the *2012 Commercial Vegetable Production Recommendations* for newer materials useful in managing DM.

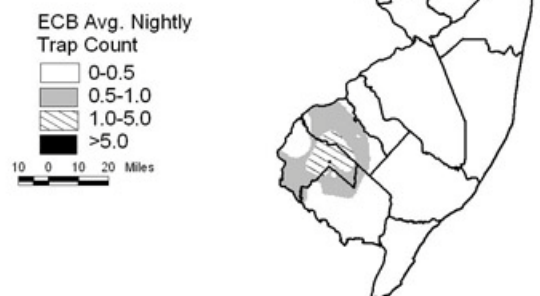
Pumpkins and winter squash vines are developing fruit at this time. Many fields with enlarging fruit are now developing **powdery mildew (PM)** infections on older leaves. It is possible to begin a protectant fungicide program for PM when the disease first appears, without sacrificing quality or yield. It is imperative, however, to scout for PM lesions. If the disease is caught too late, some loss of quality may result. Check 5 consecutive plants each in 10 random locations. Check two older leaves per plant (top and bottom) for the presence of PM lesions. These will initially be about the size of a dime, and are white, and granular in appearance. When 2 lesions are found per 50 plants, consider beginning the protectant fungicide rotation. See the *2012 Commercial Vegetable Production Recommendations* for newer materials useful in managing PM.

## **Cole Crops**

**Cabbage looper (CL)** infestations are now common, as well as **diamondback moth (DBM)** and **imported cabbage worm (ICW)**. 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.

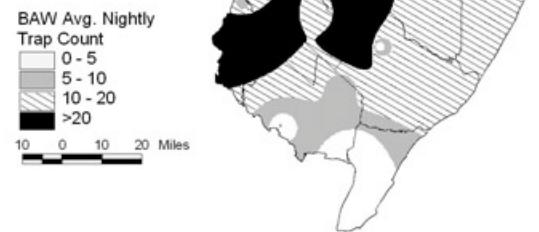
BAW larvae have been found on cabbage plantings in Hunterdon County this week. This typically southern pest will feed on cole crops as well as peppers and tomatoes. Feeding on cole crops is distinguished from other larvae in that extensive 'window pane' damage occurs while larvae are small. As they grow, they will consume all of the leaf tissue. It is important to identify this pest if it is present, because synthetic pyrethroid insecticides may not provide acceptable control.

### Distribution of Adult European Corn Borer for the Week Ending August 15, 2012



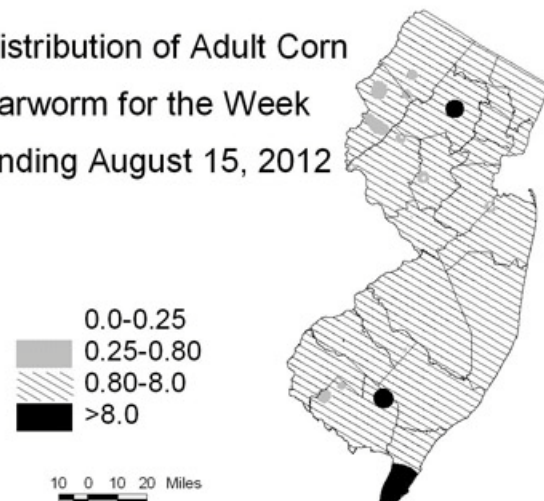
Data collected and processed by: Kris Holmstrom, Marilyn Hughes  
Rutgers Cooperative Extension & Center for Remote Sensing

### Distribution of Adult Beet Armyworm for the Week Ending August 15, 2012



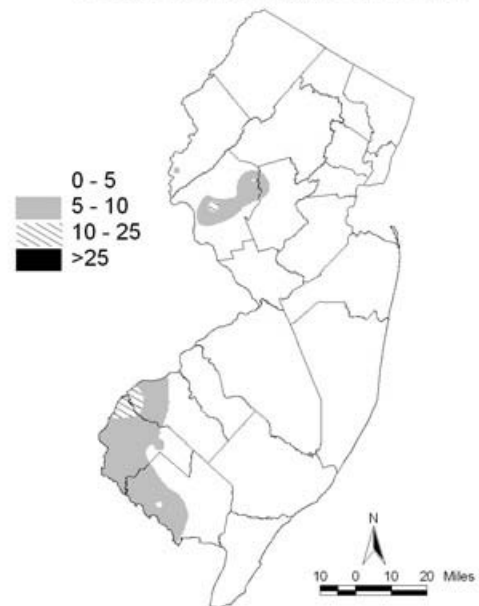
Data collected by Joe Mahar and processed by Kris Holmstrom  
Rutgers Cooperative Research and Extension

### Distribution of Adult Corn Earworm for the Week Ending August 15, 2012



Data collected and processed by: Kris Holmstrom,  
Rutgers Cooperative Extension Pest Management Office

### Distribution of Adult Brown Marmorated Stink Bug for the Week Ending August 15, 2012



Data collected and processed by: Kris Holmstrom, Sally Walker, Marilyn Hughes  
Rutgers Cooperative Extension & Center for Remote Sensing

# Preparing Your Farm Food Safety Plan

## Harmonized Audit –Post Harvest Operations Harmonized Food Safety Standard

*Meredith Melendez, Senior Program Coordinator, Rutgers NJAES Cooperative Extension of Mercer County, and Wes Kline, Agriculture Agent, Rutgers NJAES Cooperative Extension of Cumberland County*

As we explained previously the harmonized audit is an attempt to combine several audits from different auditing companies and will be put into effect by the USDA next year. The harmonized audit has more emphasis on risk assessment at all levels of the operation. This emphasis includes: additional questions, increased documentation and recordkeeping, corrective action procedures and a clear written recall program. In addition to these changes the operation will need to: review their food safety plan annually, conduct an annual self-audit, conduct a pre-plant assessment around production fields to determine potential animal intrusion, assess the water system, document water system preventative control procedures, document monitoring procedures and document corrective measures. The next several articles will detail the changes to the regular audit for the harmonized audit. This article will focus on the first half of the general questions portion of the Post Harvest Operations Harmonized Food Safety Standard.

This article refers to Standard Operating Procedures (SOP) and in other articles there will be references to Standard Sanitation Operating Procedures (SSOP). There is much more emphasis on SOP and SSOP in the harmonized audit than in standard GAP audits. Any place in the harmonized that mentions procedures the operation must have a SOP and SSOP written down. It must state exactly how a task is accomplished. These will be evaluated by the auditor.

### General Questions

#### Management Responsibility

- A written policy will outline, in general terms, a commitment to food safety, how this commitment to food safety is implemented and how it is communicated to employees will be described. This policy will be signed by Senior Management.
- Twenty-four hour contact information for key personnel involved with food safety on the farm, as well as a back-up person, will be available and will be stated in the farm plan in case of a food safety emergency.
- There will be a disciplinary policy for food safety violations. This policy will establish corrective actions for personnel who violate established food safety policies or procedures.

#### Food Safety Plan or Risk Management

- The food safety plan will address potential physical, chemical, and biological hazards and hazard control procedures, including monitoring, verification and recordkeeping for all provisions covered by this audit. The plan will include all locations of the farm operation.
- The operation will be responsible for reviewing their Food Safety Plan annually, documenting the review procedure and revising the plan as necessary.

#### Raw Material Sourcing

- The operation will have an approved supplier program for all incoming materials, including packaging. This includes a maintained list of approved raw materials suppliers and a procedure for accepting materials from alternate sources.
- The operation requires all raw product suppliers to provide evidence of food safety/GAP programs and compliance.

**Documentation and Recordkeeping**

- All food safety related documentation will be retained for a minimum of two years, or as required by prevailing regulation. The auditor will verify this through a visual check.

**Worker Education and Training**

- The individual designated for food safety responsibilities demonstrates knowledge of food safety principles. Food safety designate has completed at least one formal food safety course/workshop or by job experience.

**Traceability**

- Records kept allowing reconciliation of product delivered to recipients (one step forward) will include the items and date of receipt, lot numbers, quantities, source of the produce and transporter and be linked with records indicating one step back. Additional information may be included.
- A traceback and traceforward exercise will achieve accurate traceability within a 4 hour period.

**Corrective Actions**

- The operation will have documented corrective action procedures. This will indicate corrective actions completed for an observation or audit that contains a non-conformance with food safety requirements.

**Self-audits**

- The operation will have documented self-audit procedures which will include all aspects of the operations food safety plan. A written record of required corrective action will be documented.

**Water/Ice**

- Water sources and the operations they serve will be documented and current. The description will include one or more of the following: maps, photographs, drawings (hand drawings are acceptable). This information will be included within the water system description.
- Water installations and equipment are constructed and maintained to prevent back siphonage backflow and cross connections between product, contact water and waste water. Routine checks verify that back siphonage and backflow prevention units are functioning properly (annual or as needed to maintain continuous protection). Results will be documented.
- The operation will have procedures for changing water that is re-used, such as re-circulated water, flumes and dump tanks.
- Re-circulated water that contacts product or food contact surfaces will be treated using an approved antimicrobial process or chemical treatment.

**Containers, Bins**

- The operation will have a written policy regarding whether product-contact containers are permitted in direct contact with the ground.
- If produce does not normally contact the ground during production, the operation has considered and developed written policies regarding placement of product-contact containers directly on the ground, or whether a physical buffer (e.g., buffer bin or slip sheet) is required, or use of containers constructed to prevent contact of the produce or produce contact surfaces with the ground. Policy shall be consistent with industry standards.
- The operation has a written policy regarding acceptable product-contact containers.

Next week: Harmonized Post-harvest Operations – General Questions Part II



# Weekly Weather Summary

*Keith Arnesen, Ph.D., Agricultural Meteorologist*

Temperatures averaged much above normal, averaging 74 degrees north 77 degrees central, and 76 degrees south. Extremes were 92 degrees at New Brunswick on the 10th, and 57 degrees at Newton on the 8th. Weekly rainfall averaged 1.31 inches north, 0.90 inches central, and 1.63 inches south. The heaviest 24 hour total reported was 1.42 inches at Pomona on the 6th to 7th. Estimated soil moisture, in percent of field capacity, this past week averaged 84 percent north, 79 percent central, and 81 percent south. Four-inch soil temperatures averaged 75 degrees north, 77 degrees central, and 78 degrees south.

## Weather Summary for the Week Ending 8 a.m. Monday, 8/13/12

WEATHER STATIONS	RAINFALL			TEMPERATURE				GDD BASE50		MON %FC
	WEEK	TOTAL	DEP	MX	MN	AVG	DEP	TOT	DEP	
BELVIDERE BRIDGE	2.29	23.36	1.76	89	60	73	2	2235	390	96
CANOE BROOK	1.24	18.28	-4.43	89	61	77	5	2496	648	95
CHARLOTTEBURG	.68	16.22	-6.69	88	61	74	5	2216	757	74
FLEMINGTON	1.64	21.46	-.48	89	59	75	3	2445	549	95
NEWTON*	.63	26.18	5.09	87	57	74	4	2283	600	83
FREEHOLD	.43	19.73	-1.60	90	61	77	4	2545	521	81
LONG BRANCH	1.28	23.77	2.37	88	62	76	3	2373	428	70
NEW BRUNSWICK	1.76	20.10	-1.31	92	61	77	4	2607	499	94
TOMS RIVER	.14	17.55	-4.44	87	64	77	5	2333	397	42
TRENTON	1.67	18.82	-1.60	88	63	77	2	2744	540	93
CAPE MAY COURT HOUSE	1.99	17.67	-1.29	84	60	72	-3	2173	95	94
DOWNTOWN	1.49	15.44	-4.61	90	64	77	2	2635	420	72
HAMMONTON	.75	19.06	-2.00	90	65	79	4	2667	477	78
POMONA	2.30	20.70	1.48	89	67	78	5	2542	499	88
SEABROOK	.50	20.10	.81	89	65	79	4	2725	502	72
SOUTH HARRISON	1.26	14.00	-7.01	90	68	77	NA	2751	NA	NA

\* PRECIPITATION TOTALS FOR THE SEASON AT NEWTON ARE TOO HIGH DUE TO A PROBLEM WITH THE AUTOMATIC RAIN GAUGE FOR A FEW WEEKS, THE PROBLEM HAS BEEN CORRECTED  
WES KLINE -- GDD BASE 40 PINEY HOLLOW

LAST WEEK 271 (Ending 8/6/12)

THIS WEEK 262 (Ending 8/13/12)

TOTAL UNITS BASE 40 FOR FEBRUARY=55



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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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[www.njveg.rutgers.edu](http://www.njveg.rutgers.edu)

For back issues of the Plant & Pest Advisory:  
[www.rce.rutgers.edu/pubs/plantandpestadvisory](http://www.rce.rutgers.edu/pubs/plantandpestadvisory)