Preparing Your Farm Food Safety Plan
Part 5: Creating Logs to Document Compliance - Field Operations

Meredith Melendez, Mercer County Senior Program Coordinator and Wesley Kline, Ph.D., Cumberland County Agricultural Agent

The USDA Good Agricultural Practices 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; sample logs are available on the Rutgers Vegetable Crops Food Safety page under the manual forms tab http://njveg.rutgers.edu/html/mf-food-safety.html

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

Water Source Testing Log

This log ensures the quality and safety of the water used on the farm. All farm water sources need testing that includes generic e. coli. Municipal water, well water and surface water are required to have test results as part of your farm food safety plan. Municipal water sources need an annual test report, well water should be tested at least once a year and surface water three times a year (at planting, at peak-use, and about two weeks before harvest.) Wells used for drinking water and packing shed water will need a normal water test used for household wells, and need to include generic e. coli as well. The water testing log should include:

- Date of sampling
- Water source location
- Sample ID
- Date the sample was sent to the lab
- Lab ID
- Date lab results were received
- Were corrective measures needed? If so, what measures were needed?
- Date the corrective measures were completed
- Employee’s initials

See Food Safety Plan on page 2
**Employee Food Safety Education and Training Log**

The employee food safety education and training log indicates that each employee has had sufficient food safety training. Employees should receive this training annually. Employees given additional training or re-training can be indicated on this log as well. As noted in the previous column, the Cornell GAPs Fruits Vegetables and Food Safety: Health and Hygiene on the Farm – Worker Training Video is available through the Rutgers NJAES Cooperative Extension office in Cumberland County (856-451-2800, ext. 1 or http://cumberland.njaes.rutgers.edu). The employee food safety education and training log should include:

- Date of training
- Topic of training
- Training facilitator
- Materials used and/or handouts used for training
- Employees name, job title, and signature for each employee attending training

**Restroom and Toilet Facility Maintenance Log**

Your farm food safety plan should include a regular schedule for cleaning the restrooms. This includes in-house cleanings for permanent bathroom facilities and a service record for portable facilities. The restroom and toilet facility maintenance log should include:

- Date of maintenance
- Toilet and hand washing facilities, checked and cleaned (check mark)
- Soap checked and cleaned (check mark)
- Single use paper towels checked and/or filled (check mark)
- Toilet paper checked and/or filled (check mark)
- Trash can checked and/or emptied (check mark)
- Potable water checked and/or filled (check mark)

**Wild Animal Monitoring Log**

Surveying fields for animal manures should occur on a regularly scheduled basis, particularly just prior to harvest. A walk through a day prior to harvest is sufficient. The wild animal monitoring log should include:

- Date checked
- Time checked
- Field ID
- Status
- Corrective action needed
- Employee's initials

**Manure/Compost Use Log**

If manure/compost is not used on the farm this will need to be stated in the farm food safety plan. If manure/compost is used on the farm the following should be included in the manure use log:

- Rate applied
- Date applied
- Location applied
- Source of the manure/compost
- Incorporation (Yes or No)
- Analysis report attached for each shipment (for compost)
- Crop planting date
- Crop harvest date

Next Week: Harvest Logs

---

**IPM Update**

Kristian Holmstrom, Research Project Coordinator II, Vegetable IPM Program

**Sweet Corn**

**European corn borer (ECB)** adults are appearing in blacklight traps at fairly low levels in all parts of NJ now. The most consistent catches continue to be in the southwest and central counties (see ECB Map). We should expect higher catches as drier weather becomes dominant. As yet, no larval infestations have been discovered, but growers should expect to see it soon in the southern counties.

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

- Shirley 3
- Milltown 2
- Woodstown 2
- Allentown 2
- Pedricktown 2
- Georgetown 1
- Crosswicks 2
- Pennington 2
- Port Colden 1
- Denville 2
- Shiloh 2
- RAREC 1

A few **corn earworm moths (CEW)** have been captured in blacklight traps in Cape May County (see CEW Map). In addition, low but consistent numbers have appeared in pheromone traps in the Camden-Burlington County area. These moths represent overwintered individuals. There may be a heavier early population of this pest due to the mild winter. For now, this pest is not a serious threat to sweet corn, as plantings are not in silk. 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:

- Eldora 4
- Port Colden 1
- Cedarville 1
- Shiloh 1
- East Vineland 1
- Green Creek 1

With recent wet weather, **garden slug** injury has begun to appear in seedling stage sweet corn plantings. This damage appears as irregular holes (not neat, circular holes) within the margins of leaves. Often, the dried slime-trail of the slug is noticeable. Garden slugs may be found underneath small soil clods or debris. Generally, this is not a pest that requires management. Drier weather will limit their mobility, and cultivation disrupts them in the field. Warm weather permits rapid plant growth, outpacing slug injury.

**Cole Crops**

Egg laying by **imported cabbage butterflies (ICW)**, and **diamondback moth (DBM)** is occurring at this time, and will continue as warm weather permits their activity. Infestations of both pests have been found in the central counties, and are certainly present further south. 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.

**Brown Marmorated Stinkbug (BMSB)**

Only one BMSB adult was captured in blacklight traps this week (this was in Warren County). As adult captures increase, maps will be produced to show where activity is highest. Information on scouting, crop injury and control will also be included.
Choosing the Best Source of Nitrogen for the Crop’s Needs


Increasing global demand for nitrogen fertilizers with limited increase in production capacity has resulted in much higher prices and limited availability of some nitrogen fertilizer materials. Also, safety, security and insurance concerns have resulted in very limited availability of ammonium nitrate, which over the years has been a favorite sidedress and topdress material in vegetable production. Urea, urea-ammonium-nitrate, calcium nitrate and ammonium sulfate are the nitrogen materials most likely to be available for use this year. Growers may also want to consider the use of one of the slow release nitrogen materials. The following are a few comments about each of these materials.

Urea (46 percent N) will be one of the primary materials available. It is a synthetic organic nitrogen material (contains carbon as part of the base structure) that forms ammonia as it is broken down. If the urea is incorporated into the soil, the ammonia reacts readily with water to form the ammonium (NH4+) form of N that is held on the exchange sites of the soil. However, when urea is applied on the soil surface some of the N in urea may be lost by volatilization of the ammonia before it moves into the soil. The percent of N lost in this way from surface applied urea is more of a concern on soils with a pH near or above 7.0. If incorporated within two days after application, loss in most situations will be less than 2 percent. A rain or irrigation providing over 0.5 inch water will move the urea into the soil sufficiently to minimize loss.

Loss does increase with temperature. In a pH 6.5 loam soil at 45°F, N lost during the first four days after application will be less than 3 percent and at 75°F lost during this time period may range from 5 to 10 percent. Potential for loss is also much greater in sandy soils than in loam and clay loam soils. Urea broadcast over plants usually results in minimal injury to the leaves. For crops such as lettuce, where any damage to the leaves is a quality issue, nitrogen materials should be sidedressed alongside the row.

Urea-ammonium nitrate (UAN or 28 percent N) is a liquid material that is approximately a 50:50 blend of urea and ammonium nitrate. This material is a good material for sidedressing N. It can also be sprayed or dribbled in a band on the soil surface between rows of plants, but care needs to be taken to minimize the amount of material that gets on the foliage of plants. Spraying more than 3.5 gallons per acre directly over the foliage will cause some burn. Since half of the N is in the urea form, applying this material to the soil surface has the same risk of volatile N loss as with granular urea.

Ammonium and urea sources of nitrogen also have the potential to aggravate calcium disorders in certain vegetables. These disorders include blossom end rot of tomatoes, tip burn of leafy crops and cavity spot of carrots and parsnips. In the soil, urea is converted to ammonia and then to ammonium (NH4+). Ammonium competes with calcium for uptake by the plant. Large amounts of ammonium are present for several days (or longer) after application and can cause calcium disorders which may not be noticed immediately. Periods of heat and moisture stress or insufficient calcium soil levels contribute to the problem.

Urea and ammonium fertilizers can be safely applied as a pre-plant broadcast. The ammonium will be converted to nitrate before plants are in a sensitive stage. Pre-plant applications should be minimal; just enough to give small plants and seedlings a good start. More nitrogen can be applied later as a sidedress. Warm soils with over two percent organic matter may supply enough nitrogen to make sidedressing unnecessary. The Pre-Sidedress Soil Nitrate Test (PSNT), available at most soil test labs, can help you decide if you need so sidedress nitrogen.

Calcium nitrate (15.5 percent N, 20 percent Ca) is a good material to use when additional calcium is needed. The N is all in the nitrate form which is readily available for plant uptake, but is also more at risk for loss by leaching or denitrification with heavy rainfall events. Most vegetable growers use calcium nitrate to sidedress sensitive vegetables. Nitrate nitrogen does not inhibit calcium uptake. The calcium in calcium nitrate is helpful, but the main benefit comes from the lack of ammonium. Calcium nitrate is more expensive than urea and ammonium forms, but it doesn’t take many boxes of high value vegetables to pay this back.

Potassium nitrate (13 percent N, 42 percent K2O) is a good material for supplying some additional potassium. Ammonium sulfate (21 percent N, 23 percent S) is becoming more available in the market place. It is a good N source, especially where additional sulfur is needed. There is no concern for volatile N loss when this material is broadcast on the soil surface.

Slow-release N materials tend to release N over a 75 to 90 day period depending on the properties. With these materials, all of the fertilizer can be applied just prior to planting, and the N will gradually be released over the growing period of the crop, eliminating the need for sidedressing. Since the N is gradually released over time, the potential for N loss is reduced.

See Nitrogen on page 5
Cost of the various nitrogen materials vary considerably. Be sure to compare the costs of materials on the cost per pound of N, not per ton of material. The way to do this is as follows:

\[
\text{Cost per lb N} = \frac{\text{Price per ton material}}{\text{lbs of N in a ton of material}}.
\]

For example, one ton of urea costs $598 and contains 920 lbs N (2000 x 46%N)

Therefore cost per lb N = \(\frac{598}{920}\) lbs N = $0.65/ lb N.

### Weekly Weather Summary

Keith Arnesen, Ph.D., Agricultural Meteorologist

Temperatures averaged above normal north and central and near normal south, averaging 60 degrees north, 62 degrees central, and 61 degrees south. Extremes were 83 degrees at Toms River, New Brunswick and Flemington on the 14th and 39 degrees at Newton, Belvidere and Cape May Courthouse on the 12th. Weekly rainfall averaged 0.52 inches north, 1.13 inches central, and 1.38 inches south. The heaviest 24 hour total reported was 2.04 inches at Toms River on the 9th to 10th. Estimated soil moisture, in percent of field capacity, this past week averaged 95 percent north, 91 percent central and 89 percent south. Four inch soil temperatures averaged 56 degrees north, 61 degrees central and 60 degrees south.

### Weather Summary for the Week Ending 8 am Monday 5/14/12

<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 TOTAL</td>
<td>DEP MX MN AVG DEP</td>
<td>TOT DEP</td>
<td></td>
</tr>
<tr>
<td>BELVIDERE BRIDGE</td>
<td>.04 6.02</td>
<td>-3.40 81 39 59. 0</td>
<td>294 159</td>
<td>90</td>
</tr>
<tr>
<td>CANOE BROOK</td>
<td>.40 4.90</td>
<td>-5.48 82 42 62. 4</td>
<td>341 225</td>
<td>92</td>
</tr>
<tr>
<td>CHARLOTTEBURG</td>
<td>.43 5.77</td>
<td>-4.45 82 39 58. 2</td>
<td>306 244</td>
<td>91</td>
</tr>
<tr>
<td>FLEMINGTON</td>
<td>.41 6.53</td>
<td>-3.35 83 40 61. 2</td>
<td>353 227</td>
<td>87</td>
</tr>
<tr>
<td>NEWTON</td>
<td>.32 5.71</td>
<td>-3.39 81 39 59. 2</td>
<td>328 243</td>
<td>87</td>
</tr>
<tr>
<td>FREEHOLD</td>
<td>.63 6.53</td>
<td>-3.29 82 40 63. 3</td>
<td>403 237</td>
<td>87</td>
</tr>
<tr>
<td>LONG BRANCH</td>
<td>1.47 9.78</td>
<td>-3.37 82 46 60. 1</td>
<td>282 144</td>
<td>81</td>
</tr>
<tr>
<td>NEW BRUNSWICK</td>
<td>.54 6.96</td>
<td>-2.61 83 41 63. 2</td>
<td>408 217</td>
<td>89</td>
</tr>
<tr>
<td>TOMS RIVER</td>
<td>2.41 7.99</td>
<td>-1.87 83 41 61. 1</td>
<td>366 215</td>
<td>84</td>
</tr>
<tr>
<td>Trenton</td>
<td>.58 6.33</td>
<td>-2.57 82 46 63. 1</td>
<td>524 307</td>
<td>76</td>
</tr>
<tr>
<td>CAPE MAY COURT HOUSE</td>
<td>.53 6.10</td>
<td>-2.53 78 39 58. -3</td>
<td>284 94 77</td>
<td></td>
</tr>
<tr>
<td>DOWNSTOWN</td>
<td>1.62 5.96</td>
<td>-2.92 81 42 61. -1</td>
<td>407 179</td>
<td>88</td>
</tr>
<tr>
<td>HAMMONTON</td>
<td>1.90 7.56</td>
<td>-1.59 81 43 61. 0</td>
<td>426 217</td>
<td>81</td>
</tr>
<tr>
<td>POMONA</td>
<td>1.24 6.69</td>
<td>-1.93 80 41 60. 0</td>
<td>412 243</td>
<td>84</td>
</tr>
<tr>
<td>SEABROOK</td>
<td>1.63 7.08</td>
<td>-96 81 46 64. 2</td>
<td>507 275</td>
<td>81</td>
</tr>
<tr>
<td>SOUTH HARRISON</td>
<td>.80 6.06</td>
<td>-2.59 81 46 62</td>
<td>NA 474</td>
<td>NA</td>
</tr>
<tr>
<td>WES KLINE -- GDD BASE 40 PINEY HOLLOW</td>
<td>*LAST WEEK 135 (Ending 5/7/12) THIS WEEK 145 (Ending 5/14/12)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* FEBRUARY GROWING DEGREE DAY TOTALS 59
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 (856-769-0090)
Warren, William H. Tietjen (908-475-6505)

Vegetable IPM Program (732-932-9802)
Joseph Ingerson-Mahar, Vegetable IPM Coordinator
Kristian E. Holmstrom, Research Project Coordinator II

Newsletter Production
Jack Rabin, Associate Director for Farm Services, NJAES
Cindy Rovins, Agricultural Communications Editor

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.

The Vegetable Crops On-Line Resource Center website is a dedicated source for information on production, insect, weed and disease management, food safety, marketing and more: www.njveg.rutgers.edu

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