Evaluating Soil N Fertility Program on Sweet Corn
Joseph Heckman, Ph.D., Specialist in Soil Fertility

The nitrogen (N) status of sweet corn can be evaluated at time of fresh ear harvest. The purpose of this evaluation is to learn from the current season experience with the goal of making any adjustments to the N fertility program in the future.

Corn plants that are N deficient exhibit poor color, especially of the lower leaves that turn yellow. At the same time sweet corn yields and ear quality suffer. These are easily observable signs of N deficiency. There is generally no need for doing tissue analysis to identify N deficiency because the symptoms are visually obvious.

Sweet corn grown with adequate N should produce ears well filled to tip of the cob. Also the husk and leaf color should be green. These are easily observable signs of crop N sufficiency.

Not easily observable, however, are signs of excessive application of N to sweet corn. There is just no way to easily tell simply by looking at sweet corn plants fertilized with too much N, that fertilizer was over supplied and money was wasted.

Corn stalk tissue analysis is a useful method to identify fields were the N fertility program over shot the target. Although harvest time it is too late for corrective action on the current crop, one can use stalk testing as a way to learn from experience.

Adjustments, if needed, in the N fertility program can be made in the following year. The ability to learn from data provided by stalk testing can lead to better N management and potentially more economical sweet corn production.

The procedures for conducting this test are given in Rutgers Cooperative Extension Fact Sheet 1020: Sweet Corn Crop Nitrogen Status Evaluation by Stalk Testing. http://njaes.rutgers.edu/pubs/publication.asp?pid=FS1020

There is an analogous stalk test for field corn. However, in the case of field corn the growth stage for sample collection and the data interpretation differs. Iowa State University has a good fact sheet about it at this link: http://www.extension.iastate.edu/Publications/PM1584.pdf

An outline of the procedures for sweet corn is as follows:
1) Focus of sweet corn fields where there are questions or concerns that possibly an excessive N fertilizer was applied to grow the crop. This represents the kind of situation where the findings will be most valuable for making adjustments in the future.
2) Stalk samples must be collected on the same day that the sweet corn crop is harvested for fresh ears.
3) Use a sharp knife or pruners to cut sections of the lower stem tissue. Save the corn stalk section that is at 6 to 14 inches above the ground. (A tool specially designed by welding two cutters together quickly cutting corn stalks is shown in photo.)
4) Collect about a dozen of these 8-inch segments of stalk tissue. Use a random sampling pattern from the sweet corn block of interest.
5) Remove all of the leaf tissue from the stalk segments.
6) Place the stalk segments in a paper bag that is labeled with date and field name.
7) Dry the samples with bag standing open inside a hot summer greenhouse or use an oven. If the samples cannot be dried immediately, they may be stored for a few days in a refrigerator. Do not allow the samples to become moldy.
8) Send the samples to an agricultural testing laboratory. Request that the sweet corn stalk samples be tested for Total Nitrogen by Combustion.

Interpretation of Results from Stalk Nitrogen Test

Stalk samples testing in the range of 1.6 to 2.2 % N fall with the range considered optimal for sweet corn. Samples testing greater than 2.2% N represent a sweet corn crop that has been excessively fertilized with nitrogen.

Once a consistent pattern of excessive N fertilization is evident for several fields and over a period of seasons has been identified, it is time to reevaluate the N fertility program for sweet corn. A grower should gradually back off from their usual N application rate and adjust to a lower rate in subsequent growing seasons. They should continue to monitor the crop N status as already described to produce a satisfactory crop while using the newly adjusted N fertility program to confirm that it is now on target.

Incubator Farm Program

A new program designed to provide a helping hand for beginning farmers is set to debut in the coming year. In collaboration with Duke Farms, the Northeast Organic Farming Association of New Jersey (NOFA-NJ) is launching an incubator farm that will create a network of solutions to a complex issue – too few beginning farmers and not enough access to farmland. The goal is to once again make small-scale farming a viable profession in New Jersey.

“We are thrilled to offer this new program,” said Eve Minson, Beginning Farmer Program coordinator. “The Incubator Farm is basically a low-risk opportunity for a new farmer to launch a business. Through this three-year program, he or she will have access to land and a chance to test out a business model on a small-scale, build up capital, graduate onto his or her own land and run a successful business.”

According to the USDA, the average age of American farmers is over 55 and continues to increase, while the number of young farmers under the age of 25 has declined by 30 percent. At the same time, new people are coming to agriculture and beginning farm enterprises; however, many of these new farmers do not come from farming backgrounds and may not possess the technical or hands-on skills needed to start a successful farming business. In response to this issue, the USDA has begun to grant funds to regionally-based groups to train and support beginning farmers through their Beginning Farmer and Rancher Development Program. NOFA-NJ was a recipient a Beginning Farmer and Rancher Development Grant in 2011.

“Duke Farms is pleased to support this innovative program that promotes farming in New Jersey,” said Timothy M. Taylor, executive director, Duke Farms Foundation. “Obtaining access to land is a major hurdle for most beginning farmers, so we are making 140 acres of our land available for the incubator farm. In addition, we also will also help in the preparation of the land by plowing, disking and tilling. Supporting healthy agricultural practices is part of our mission, to encourage and educate people to become good stewards of the land.”

Application information on the Beginner Farmer Program will be available later this year and farming will get underway in 2013. This project was supported by the Beginning Farmer and Rancher Development Program of the National Institute of Food and Agriculture, USDA, Grant #2011-49400-30739.

For more information, visit the NOFA-NJ Website at www.nofanj.org.
IPM Update  
Kristian Holmstrom, Research Project Coordinator II, Vegetable IPM Program

Sweet Corn  
European corn borer (ECB) adult catches are extremely low across the state at this time. The highest average catches at this time are in Mercer County (see ECB Map), but even these are low. ECB injury is common in whorl 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:
- Clinton 1  Lawrenceville 1  Princeton 1
- Dayton 1  Little York 1  Sergeantsville 1
- Denville 1  Morristown 1  Shirley 1
- Hackettstown 1  Pennington 1  South Branch 1

Corn earworm moth (CEW) catches have increased around the state. Higher catches are occurring in southwestern NJ, with increases in some northern county traps as well (see CEW Map). Large increases have occurred in pheromone traps in the area stretching from western Burlington County southeast through the Camden/Atlantic/Gloucester County border area. Light trap catches from North Carolina appear to have peaked and are now lower than a week ago. Adult emergence appears to be occurring in our area now, with numbers on the rise. Large scale increase can occur at any time when prevailing winds assist moth flight from points to our south. These moths are a significant 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:
- Green Creek 5  Centerton 2  Woodstown 2
- East Vineland 4  Matawan 2  Eldora 1
- Cinnaminson 3  Pedricktown 2  Griggstown 1
- Denville 3  Phillipsburg 2  Sergeantsville 1

Silking Spray Schedules*:
- South – 3 days
- Central – 3-4 days
- North – 3-4 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 are appearing in some pepper fields at this time. 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 cross-hatched 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)) 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 risen sharply in the northern counties, while in the south catches have declined.

See IPM on page 4
somewhat over the past 5 nights. At present, the highest catches are from Cumberland and Hunterdon counties (see BMSB map). BMSB injury on peppers has begun to appear in research plots at the Snyder Farm in Hunterdon County, as well as on tomatoes and peppers 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 ripen. 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:

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</tr>
<tr>
<td>Little York</td>
<td>16</td>
</tr>
<tr>
<td>Phillipsburg</td>
<td>11</td>
</tr>
<tr>
<td>Woodstown</td>
<td>10</td>
</tr>
</tbody>
</table>

Tomatoes

With recent hail events occurring around the state, growers should be alert to the increased chance of bacterial infections in tomatoes. Hail creates numerous wounds on plants, providing easy access for 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

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.

A sentinel plot containing susceptible and resistant cucumber varieties, as well as muskmelons, watermelons, acorn and butternut squash and pumpkins has been established at the Snyder Research and Extension Farm in Hunterdon County. This purpose of this plot is to detect the presence of downy mildew (DM) in northern NJ. As of Tuesday morning (8/07), DM has infected all cucumber varieties, including those with some resistance. No other cucurbit crops were infected. 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.

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.

See Distribution Maps on page 5
Great Tomato Tasting
Rutgers Snyder Research and Extension Farm
140 Locust Grove Road, Pittstown, Hunterdon County, NJ 08867
Wednesday – August 29, 2012 (Rain or Shine), 3pm - dusk

Rutgers New Jersey Agricultural Experiment Station and Rutgers Cooperative Extension proudly announce the Annual Snyder Farm Open House and Great Tomato Tasting!

The event includes the popular tasting of over 60 heirloom and hybrid varieties of beefsteak, plum, cherry and grape tomatoes. Also, tasting of apples and peaches from the NJAES Tree Fruit Breeding Program, basil, honey and more. The Melda C. Snyder Teaching Garden will showcase demonstration gardens of deer tolerant ornamentals; blueberries, hazelnuts, and hollies from the Rutgers breeding programs, along with a wall of fruit highlighting apple and upright growing peach trees for the home landscape.

Wagon tours of the farm’s research plots will be held throughout the event. Included will be chef demonstrations featuring preparation of several tomato recipes.

Please bring a non-perishable food item to support the Rutgers Against Hunger (RAH) program; http://rah.rutgers.edu

Admission: $7.00 per person, children under 10 are free
RSVP please: 908-730-9419 x-3501 or online https://njaes.rutgers.edu/rsvp/tomato.

For more information visit: http://snyderfarm.rutgers.edu/tomatoes.html.
Preparing Your Farm
Food Safety Plan
Harmonized Audit – Harvesting and Transportation Harmonized Food Safety Standard
Meredith Melendez, Mercer County Senior Program Coordinator and Wesley Kline, Ph.D., Cumberland County Agricultural Agent

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 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.

HARVESTING

Water/Ice

A SOP (Standard Operating Procedure) is written for water used in contact with product and food contact surfaces. This SOP must include water-change schedules and must be developed for all uses of water. Either microbial and/or chemical (e.g. test strips) testing should be performed, as appropriate to the specific operation, to demonstrate that acceptance criteria have been met. The operation needs to know the level of disinfectant required, the concentration in the water and be able to monitor for it. The auditor will look for evidence of the existence of water use SOP’s.

The water use SOP will require that re-circulated water be treated using an approved antimicrobial to prevent it from becoming a source of contamination, according to prevailing regulation or industry specific standards for the commodity. The auditor will review the water use SOP for completeness and observe water treatment records for adequacy and consistency of treatment. The disinfectant in the water is not to remove pathogens from the produce, but to eliminate cross-contamination as a possible problem.

- Water use SOP’s will address the condition and maintenance of the water delivery system. This system will be maintained so as not to serve as a source of contamination of produce, water supplies or equipment with pathogens, or to create an unsanitary condition. The auditor will review the SOP and view the maintenance records.

Containers, Bins and Packaging Materials

- The operation must have a written policy regarding the storage of harvesting containers. The containers should be stored in a manner that prevents contamination to the extent feasible and appropriate. Containers should be stored in a closed building or if outside covered to reduce the chance of contamination. If in closed buildings, it is a good idea to cover containers in plastic or tarp. The auditor will look for the policy and observe current practices in compliance with the policy.

- The operation must have a written policy regarding the inspection of food contact containers prior to use. Food contact containers, packing materials, and pallets will be visually inspected, clean, intact and free of any foreign materials prior to use. Containers should be sufficiently maintained so as not to become a source of contamination. The auditor will look for the policy and observe current practices in compliance with the policy.

- The operation will have a written policy regarding acceptable harvesting containers. The types and construction of harvest containers and packing materials shall be appropriate to the commodity being harvested and suited for their intended purpose. The auditor will look for the policy and observe current practices in compliance with the policy.

Field Packaging and Handling

- The operation shall have a written policy that damaged or decayed produce is not harvested, or is culled. Employees are trained that only sound produce appropriate for the intended use is harvested, and that produce that has been damaged to an extent that it posed a microbial food safety hazard is not harvested or is culled. The auditor will review the written policy and evidence of employee training. The auditor will inspect the harvest or sorting operation for evidence of compliance.

- Products that touch the ground will not be harvested unless the produce normally grows in contact with the ground. Crops grown on plastic are not in contact with the soil. The operation needs to consider and develop written policies regarding produce that comes in contact with the soil (e.g. drops). The policy will be consistent with industry standards or prevailing regulations.
regulations. The auditor will review the written policy and evidence of employee training. The auditor will inspect the harvest or sorting operation for evidence of compliance.

- Harvest procedures will include measures to inspect for and remove physical hazards. Procedures will be in place to detect glass/plastic breakage and remove possible physical contamination such as glass, metal, rocks, or other hazardous items during harvest operations. The auditor will inspect the harvest or sorting operation for evidence of hazard control.

- Cloths, towels, or other cleaning materials that pose a risk of cross-contamination will not be used to wipe the produce unless there is a procedure to prevent cross-contamination. It is next to impossible to reduce the risk when cloths, towels, etc. are used. The best option is not to use them. The auditor will review whether the operation uses cloths or other produce cleaning materials and, if so, how the operation prevents cross-contamination between uses.

- If produce is packed in field, the operation must consider and develop written policies regarding placement of packing materials directly on the soil, or whether a physical buffer (e.g., buffer bin or slip sheet) is required. The policy shall be consistent with industry standards. The auditor will observe whether the operation has a policy in place and will look for current practice compliance with the stated policy.

**Postharvest Handling and Storage**

- The operation needs a policy, in compliance with current industry practices or regulatory requirements for that commodity, regarding handling, walking, stepping, or lying on harvested produce, food contact surfaces or packaging materials, that may result in contamination. The auditor will review the policy and produce handling practices for evidence of compliance.

**TRANSPORTATION**

**Equipment Sanitation and Maintenance**

- The operation will have a procedure describing how trash shall be handled and transported out of the field in a manner that does not pose a safety risk. The auditor will review the trash handling procedures for field operation, and observe trash handling practices for evidence of compliance.

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**Weekly Weather Summary**

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

Temperatures averaged much above normal, averaging 77 degrees north, 78 degrees central and 77 degrees south. Extremes were 94 degrees at South Harrison, Downtown and Hammonton on the 6th, and 59 degrees at Belvidere on the 31st. Weekly rainfall averaged 1.55 inches north, 1.11 inches central, and 0.93 inches south. The heaviest 24 hour total reported was 2.60 inches at Hammonton on the 5th to 6th. Estimated soil moisture, in percent of field capacity, this past week averaged 88 percent north, 79 percent central, and 74 percent south. Four inch soil temperatures averaged 76 degrees north, 77 degrees central and 76 degrees south.

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**Weather Summary for the Week Ending 8 am Monday 8/6/12**

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*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 260 (Ending 7/30/12) THIS WEEK 271 (Ending 8/6/12)*

TOTAL UNITS BASE 40 FOR FEBRUARY=55
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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.

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