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# Agronomy Notes

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Capital Region Extension Agronomy Team

grow BETTER CROPS AND PROFITABILITY

PENNSTATE

an OUTREACH program of the College of Agricultural Sciences

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## Cornstalk Testing to Evaluate Nitrogen Management

Nitrogen management in 2006 has certainly been a challenge. Regardless, you can tell if the right amount of nitrogen was used by measuring nitrate concentrations in the lower portion of cornstalks at the end of the growing season. The test is called the "end-of-season cornstalk test". It can be used to evaluate N management practices used in any field in any year.

Corn plants suffering from inadequate N availability remove N from the lower cornstalks and leaves during the grain-filling period. Corn plants having more than adequate N accumulate nitrate in their lower stalks at the end of the season. Field research has established what concentration of nitrate in the stalk is low, high or just right for optimum corn yields.

***Thoughtful use of the test for a few years should help determine optimum rates.***

All corn producers should consider using the test on a few fields each year. Those who learn that their fields usually test in the optimal range need not make larger investments in time or money. Those who learn that they usually apply too much or too little N to some or all of their fields will find it profitable to adjust rates of application. Thoughtful use of the test for a few years should help determine optimum rates.

Stalk sampling can be done anytime between about the 1/4 milk line stage of the grain and up to 3 weeks after the grain forms a black layer. For fields taken for silage, this would be done just before silage harvest (often about 1/2 milk line stage). Areas differing in soil types or management histories should be sampled separately. Stalks severely damaged by disease or insects should not be used.

The portion of each plant sampled is the 8-inch segment of stalk found between 6 and 14 inches above the soil. Remove leaf sheaths. Ten representative plants would be a good sample size for a field. Cut each of your stalk sections into approximately two inch long segments before you send them to the lab. If possible, dry the samples immediately or send them to the lab as soon as possible after collection. If there is more than a day between sampling and sending, store sample in paper bags and refrigerate (don't freeze). To prevent molding, do not store samples in plastic bags, or other non-breathable container for an extended period of time. Package the sample(s) in cardboard box or other container. Send the sample, completed submission form and payment ($10.00 per sample) to the address listed below.

Make check payable to: Penn State University
Submit samples to:
Agricultural Analytical Services Laboratory
Tower Road
University Park, PA 16802

### Interpretation of stalk nitrate concentrations

- **Low** < 700 ppm - Nitrogen likely limited yield and management should be evaluated to determine why it was inadequate.
- **Optimal** 700 – 2000 ppm - Nitrogen was adequate but not excessive for optimum economic yields in this field.
- **Excessive** > 2000 ppm - Nitrogen in the field was in excess of what is needed for optimum economic yields. You should determine why the N supply was excessive.

Out of all the samples done last year at Penn State, forty seven percent (47%) were in the excessive range. Twenty seven percent (27%) were low and about the same were in the optimum range. This means that almost three of every four fields have room for improvement. When if comes to nitrogen management, we can do better. The end of season stalk nitrate test is a tool you can use.

**John Rowehl, CCA**
**Grain Crops-Cumberland County**

# Keys to Silage Harvest Success

### Moisture Level at Harvest

Probably the most critical condition for proper silage harvest is the whole plant moisture level. Silage feeding trials show the best performances when silages are harvested at 65% to 70% moisture. Moisture any higher can cause seepage and poor fermentation, which can cause additional feeding challenges. Each storage type has specific moisture guidelines for producing best quality.

| Storage Type | Optimum moisture |
|---|---|
| Bunkers/Piles | 65 – 70% |
| Bags | 60 – 70% |
| Concrete Uprights | 62 – 67% |
| Sealed Uprights | 50 – 60% |

### Determining Moisture Level

Visually looking at a corn plant is not an accurate method to determine harvest. A starting point to begin monitoring plant moisture levels is when the ear begins to dent. At this stage, sugar in the kernel is being converted into starch and the kernel begins to shrink. When the milk line, which shows the change from milky starches to hard starch in the kernel, is ½ of the way down the kernel, whole plant moistures will be close to optimum moisture levels, on average 63%. Unfortunately, crop moisture levels can vary greatly across hybrids and locations at ½ milk line (ranges - 53 to 73%). Do not depend on this method for accurate moisture levels.

The best method is to cut representative stalks, shred them and run an accurate moisture determination test. After denting, whole plant moisture levels will decrease approximately 0.6% per day. Silage harvest can be predicted but additional monitoring of moisture will be needed. As plant moistures approach 62%, the dry-down rate rapidly increases. Don't allow your silage to get too dry.

### Length of Cut

Recommendations for length of cut for silage vary depending on crop condition. Drier crops should be cut finer to produce smaller particles that minimize air pockets. Use of highly digestible hybrids requires a slightly longer cut to maintain effective fiber. General recommendation is a 3/8 inch theoretical length of cut (TLC) but more mature crops may require a shorter length. For non-processed silage the recommended chop length is 3/8 to 3/4 inch TLC. Some farms rely on their nutritionists to fine tune the chop length based on farm specific conditions.

### Height of Cut

In recent seasons, some producers have cut silage at a 10 to 20 inch height. This practice reduces silage fiber and lignin percentage and increases starch and energy content. However, silage yields are reduced five to ten percent. Higher chopping can also be used to change whole plant moisture contents. By cutting higher, harvest may advance by 3 to 4 days. Higher chopping may be an option if excess forage dry matter is available. However, this will increase the final cost per ton. To balance this trade-off between quality and yield, the decision should be based on an economic assessment.

### Processing Silage

At lower whole plant moistures, crop maturity may affect silage quality. Fiber and starch digestion decreases as corn dries down. Processing at harvest may be needed to maximize digestion on more mature crops. The goal of processing is to ensure breakage of the kernel and cob to assist digestion. Processing also can affect fiber length so choppers equipped with a processor typically lengthen their cut to ¾ inch.

2006 will go down as a season of early plantings. We used to say "knee high corn by the 4th of July". This year many fields of corn were 9 feet tall by the 4th and tasseling by July 7th. Silage harvest is just around the corner. Will you be ready??

**Paul H. Craig, CCA**
**Forages-Dauphin County**

# Crop Insurance Update

### Double-Check Acreage Report and Summary

A "Summary of Protection" or "Schedule of Insurance" is received a few weeks after filing your acreage report information with your crop insurance. The form reflects the insurance company's record of your insurance protection for 2006 spring crops. It's a good rule of thumb to compare the Summary to your completed acreage report to make sure the information you reported was interpreted and transferred correctly. Contact your insurance agent immediately to get any discrepancies corrected, otherwise they could adversely affect your premium bill and/or claim payment.

### Cutting Damaged Corn for Silage

If you plan to cut damaged grain type corn for silage, it's important that the grain content be determined regardless of whether you insure on a tonnage or grain yield basis. If you insure on a grain basis (i.e. with CRC) a loss is determined by comparing the revenue guarantee to the appraised yield times the October CBOT average price for the December contract. If you insure on a tonnage basis, the grain content is the basis for quality adjustment of the silage tonnage.

### CRC Popular With Producers

PA producers continue to show a strong preference for crop revenue policies (CRC). In 2006, 62% of the corn and 65% of the soybean buy-up policies are CRC.

### Crop Damage Reporting Requirements

**(if a loss is anticipated)** The insurance policies require that **written notice be given to your crop insurance agent** (by crop by unit (farm))**:**

- Within 72 hours of discovery of damage or loss,
- 15 days before harvest begins, and
- Within 15 days after harvesting is completed but not later than 1 0/31 for small grains.
- **Don't destroy evidence of damage until a loss adjuster evaluates it!**

### Authorization Required to Leave Sample Rows for Yield Determination

The policy requires that loss adjusters select the sample row areas for later yield determination unless a waiver is granted to the producer, due to heavy claims work load. For this reason, it's important that notice of damage be filed with your crop insurance company at least 15 days before harvesting begins on damaged acreage. This will provide the insurance company the opportunity to timely designate the sample row areas.

Additional details on reporting crop damage are available from authorized crop insurance agents.

**Gene Gantz**
**RMA/USDA**
**717-497-6398**

## Current IPM Threshold Interests

### Soybeans

**Aphids** are more prevalent in fields that are planted earlier, sheltered, or near buckthorn. Colonization from buckthorn is essentially done, so increasing infestation levels within fields will depend on local buildup and re-distribution. The aphid buildup depends on weather (rainfall, temperature, Soybean variety and phenology, drought stress, and natural enemies. Now is the time to begin scouting on a regular basis. 1,250 aphids per plant require treatment.

**Late season weed** seeding can be an issue. If nightshade is present, consider a pre-harvest paraquat treatment to allow for dry down of the fruit before harvest.

**Soybean Rust** is not a concern at this point, but if it appeared before the final R stages, treatment would be necessary.

**Septoria brown spot** and other leaf diseases invade soybeans late season. Where scouting indicates the disease is present and has invaded the mid to upper canopy, treatment may be beneficial.

### Alfalfa

**Leafhopper** thresholds vary greatly by alfalfa height and if the variety is leafhopper resistant. The taller the plant, the more leafhoppers are needed to justify spraying. Keep in mind that in the Capital Region, the reproduction of leafhoppers halt later in August, after which treatments are not justified unless large numbers of adults are present. Refer to the leafhopper scouting chart found at **http://www.ento.psu.edu/extension/factsheets/PotatoLeafhopperAlfalfa.htm**

### Corn

**Late season weeds**, like Bur Cucumber, can be spot treated. Products like 2,4D are labeled after brown silk and can be effective as a harvest aid and in preventing weed seed production.

**Rootworm beetle** treatment is warranted if 5 or more beetles are found per silk mass and when 75% of the plants have silked and have silks clipped to within 1/2 inch or less of the husks. **Japanese beetle** treatment may be necessary if there are 3 or more beetles per silk mass and pollination has not occurred. Most important is pollination. If it has not occurred, then silk clipping by these pests will not effect yield. Source: Ron Hammond-Ohio State University

**Late season weeds**, like Bur Cucumber, can be spot treated. Products like 2,4D are labeled after brown silk and can be effective as a harvest aid and in preventing weed seed production.

**Stalk Rot** scouting should be done before the black layer stage, about 40-50 days after pollination. While scouting, look for visible symptoms and test stalk firmness by pinching the lower internodes with your thumb and forefinger. Healthy stalks are firm and can't be compressed. If a stalk can be compressed or feels soft, it is rotted and a good candidate for lodging. Check at least 100 plants per field in different locations. Different hybrids and fields with different tillage, rotation or fertilization histories should be scouted separately. If a field has more than 10-15 percent of the stalks rotted, significant lodging is likely. Source: Iowa State University.

**Del Voight, CCA**
**IPM-Lebanon County**

## Time to Plan for Cover Crops

Whether it's for extra forage, soil stewardship, or numerous other purposes, spend some time now, thinking about your cover cropping program. What goals do you have? Do you want to add nitrogen to the soil, or scavenge and save nitrogen from manure applications? With a cover crop, you can build soil tilth and productivity while protecting your fields from erosion. Legumes can often contribute up to 100lbs of Nitrogen to the following crop but need to be established in the late summer for optimum growth. Grasses can be planted later , establish faster and will make a mellow seedbed. Mixing the two can have additional benefits.

See the following table (adapted from the Penn State Agronomy Guide 1.10-5) to help select a species that fits best with your goals.

**Jeffrey Graybill, CCA**
**Agronomy-Lancaster County**

## Characteristics of Common Cover Crops

| Species | Life cycle[a] | Seeding rate[b] (lb/A) | Seeding date | N-fixation (lb/A) | Advantages | Disadvantages |
|---|---|---|---|---|---|---|
| Hairy vetch (Visa villosa Roth) | WA | 20 - 40 | Aug / early Sept | 80 - 250 | Most cold tolerant and highest yielding of all winter annual legumes; above-average drought tolerance; adapted to wide range of soil types. Mix with Rye for more biomass & earlier growth. | Requires early fall establishment; slow to establish; little winter cover possible; matures late spring; high P and K required for maximum growth; can harbor pests; potential weed problem in winter grains |
| Crimson clover (Trifolium incarnatum L.) | WA / SA | 9 - 40 (avg. 18 - 20) | Aug | 70 - 130 | Rapid growth; above-average shade tolerance; forage use (no bloat); good nematode resistance. | Poor heat and drought tolerance; no-till planting in residue is difficult due to steminess. **Can winter kill**. Plant in SE PA only. |
| Red clover (Trifolium pratense L.) | SLP (2-3 yr) | 7 - 18 | Aug | 100 - 110 | Thick deep taproot; adapted to humid areas; tolerates wet soil conditions and shade; high biomass production. | Initial growth slow; high P and K requirements for maximum growth; seed can persist creating volunteer problems; pure stand forage causes bloat. |
| Spring oats (Avena sativa L.) | SA | 100 (3 bu) | Spring or fall | Good nutrient scavenger (less if fall seeded) | Rapid growth in cool weather; ideal quick fall cover or nurse crop with legumes; winter kills; various uses: cover crop to food source. | Higher lodging potential; somewhat susceptible to diseases and insect pests. **Winter kills.** |
| Annual / perennial rye grass (Lolium spp.) | WA/Per. | 15-15+ | Spring or fall | Fair - excellent nutrient and moisture scavenger | Tolerant to wide range of soil conditions, winter-hardy, excellent quality forage; forms dense sod. | Can be difficult to kill. Annual can re-seed and become weed in small grains. |
| Forage Radish | WA | 10-13 | Aug to Sept 15 | Nutrient scavenger | Large deep taproot to alleviate compaction; very competitive. Plant with a cereal crop in alternate rows for benefits of both. | Must be planted early for maximum growth; **will winter kill**; foliage decompose quickly exposing soil unless mixed with a grass. |

[a] WA=Winter Annual; SA=Spring Annual; SLP=Short Lived Perennial

### *Penn State Cooperative Extension Offices of the Capital Region*

| | | | |
|---|---|---|---|
| Adams | (717) 334-6271 | Lancaster | (717) 394-6851 |
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