Late Season Stalk Nitrate Test

Are Changes in N Management Needed?

Has your corn silage received the appropriate amount of nitrogen this year?
What is the Stalk Nitrate Test?

- The stalk nitrate test is a useful tool that indicates whether the nitrogen supply for that year was low, optimal, or in excess to produce the most optimum yielding corn.
- A comparison of two or more years of test results is required before any interpretations can be made.
Timing of Sampling

- Stalk nitrate samples can only be taken any time between optimum harvest time for silage till grain harvest time. If taken after harvest (if the stubble is taller than 14 inches) take the samples within a couple of days.
Tools Needed for Sampling

- A ruler, tape, or a 14 inch dowel marked at 8 inches
- Hand pruners
- Large kitchen knife or machete
- Brown paper bags
How Many Stalks Are Needed?

- For fields of 15 acres or less: 15 stalks
- For fields larger than 15 acres: 1 stalk per acre
Cutting the Stalk

First, measure up 14 inches

Cut so 14 inch stubble remains
Cutting the Stalk

Measure 6 inches from the soil

This leaves an 8 inch stalk
Corn stalk segment 8 inches in length for testing

Top cut 14 inches above ground

Bottom cut 6 inches above ground

Corn Stalk Nitrate Test
Field Sampling Procedure
Preparing Stalks for Submission

- During sampling, don’t touch the soil with the stalk; soil contamination will adversely affect test results.
- Once the stalks are taken, quarter them lengthwise, take one of the quarters per stalk (toss the rest) and place in a brown paper bag; this speeds the drying process, reduces the possibility of mold growth, and reduces mailing and sample processing cost.
Quartering

Carefully quarter the stalk using a machete or kitchen knife
Quartering is a quick and easy way to ensure that a quality sample arrives at the laboratory. You only need one of the four quarters per stalk so toss three out and keep the 4th to reduce mailing and sample processing costs.
Interpreting the Results

- Research conducted on New York farms in supports the following interpretations:
  - Low = less than 250 ppm N
  - Marginal = 250-750 ppm N
  - Optimal = 750 to 2000 ppm N
  - Excess = greater than 2000 ppm N
Visual Indicators

- **Low**: <250 ppm
- **Marginal**: 250-750 ppm
- **Optimal**: 750-2000 ppm
- **Excess**: >2000 ppm
Low (<250 ppm N)

- These fields would likely have benefited from some additional N.
- At harvest time, leaves are dead to or above the ear leaf and/or the entire plant has a light to very light green color.
- Drought symptoms are almost the same as N deficiency symptoms so drought will make N deficiency appear to be worse.
Marginal (250-750 ppm N)

- In some years, yields could have been increased with some additional N. In those years, plants look like described under low CSNT. In other years, the N supply was sufficient.
- Since it is difficult to predict what kind of growing conditions a season will bring, farmers are advised to target CSNTs in the optimal range.
Optimal (750-2000 ppm N)

- Nitrogen availability in these fields was within the range needed for optimum economic corn production.
- In this range, three of the five lower leaves will likely be dead by silage harvest time while the top leaves remain medium to dark green.
Excess (>2000 ppm N)

- The corn had access to more N than it needed for optimum yield.
- Most likely, fewer than three leaves from the bottom will have died and the top leaves remain medium to dark green.
- If manure and/or N fertilizer were applied, the application(s) supplied more N than the crop needed that growing season.
Multiple Year Assessment

- Field history, manure and fertilizer application, other N inputs, soil type, and growing conditions all impact stalk nitrate test results, *which is why stalk nitrate test results should be monitored for 2-3 years before management changes are made.*
Summary

- The CSNT reflects N availability during the growing season. The test allows for evaluation + refining of N management for a specific field; multiple years of data are needed.
- Corn stalk nitrate test results >2000 ppm indicate excessive levels of available N during the growing season. If such high CSNTs occur multiple years in a row, consider lowering fertilizer and/or manure application rates.
Sample Submission

Submit samples to:
Quirine Ketterings or Sanjay Gami

*Nutrient Management Spear Program*
Dept. of Animal Science, 3123/317 Morrison Hall
Cornell University, Ithaca NY 14853

Include:
- Submission form: [http://nmsp.cals.cornell.edu/NMSPLabSubmissionForm1.pdf](http://nmsp.cals.cornell.edu/NMSPLabSubmissionForm1.pdf)
- $10/sample
More Information

- Nutrient Management Spear Program (NMSP) Agronomy Fact Sheet series:
  http://nmsp.cals.cornell.edu/guidelines/factsheets.asp

- Quirine Ketterings
  - qmk2@cornell.edu
  - 607 255 3061