

Assessing Stalk Nitrate for Nitrogen Management

The end of season corn stalk nitrate test provides an evaluation of the efficiency of your corn nitrogen program. Compared with multi-year observations, the interpretation of this late season test provides insights into N management options for the coming years.

Collecting a Quality Sample

Sampling is typically done 1-3 weeks after black layers have formed on 80% of the kernels on most ears. Sample areas within fields, similar to how you would collect soil samples. Within each area of the field, collect individual stalk segments from fifteen representative plants. Cut the stalk 6" from the ground. Cut the bottom 8" of the stalk for the sample. Bundle 15 cut stalks from each area and send immediately to the lab. Do not ship in a plastic or sealed container. If immediate shipment is not possible store in a refrigerator until shipment can be made, but do not freeze.

Ship stalks as soon as possible to: 7501 Miles Drive, Indianapolis, IN, 46231.

Laboratory Procedure

Samples are dried and ground to ensure a uniform sample. Analysis is done by ion selective probe method. To ensure quality results in our testing procedure, control samples with known values are included in every testing batch. Turn-around time is dependent on drying time, and can take up to 7 days.

Interpretation for Nitrogen Use Efficiency

The value of this test comes from repeated observations of corn stalks, over several years for a given field:

Use the Nitrate-N (NO₃-N ppm) “As Is” value to determine position in the appropriate range listed below:

Purdue University =

LOW <450 ppm	OPTIMAL 450-2000 ppm	EXCESSIVE >2000 ppm
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Iowa State University =

LOW <250 ppm	MARGINAL 250-700 ppm	OPTIMAL 700-2000 ppm	EXCESSIVE >2000 ppm
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- If a field regularly tests in the OPTIMAL range, the grower’s nitrogen programs is most likely performing well.
- If the field regularly tests LOW or MARGINAL, then additional amounts of nitrogen fertilizer may be justified in future years.
- If a field regularly tests EXCESSIVE, then lower amounts of nitrogen fertilizer should be considered in future years.

References:

Nielson R. 2003. End-of-Season Corn Stalk Nitrate Test.
<http://www.kingcorn.org/news/articles.03/StalkNitrateTest-0915.html>

Brouder, S. 2003a. Cornstalk Testing to Evaluate the Nitrogen Status of Mature Corn (AY-322-W).
<http://www.agry.purdue.edu/ext/pubs/AY-322-W.pdf>

Sawyer, J and Mallarino A. 2018. Use of the End-of-Season Corn Stalk Nitrate Test in Iowa Corn Production (CROP 3154).
<https://store.extension.iastate.edu/Product/pm1584-pdf>