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LATE SEASON CORN STALK NITRATE-N TEST TO EVALUATE NITROGEN FERTILIZER MANAGEMENT

Recent research has indicated that the concentration of nitrate-N ($\text{NO}_3\text{-N}$) in the lower part of the corn stalk when corn is at the black layer stage of maturity may be related to fertilizer nitrogen use efficiency. Corn plants suffering from an inadequate amount of soil $\text{NO}_3\text{-N}$ will have a low concentration of $\text{NO}_3\text{-N}$ in the lower part of the stalk while plants that have an excessive amount of soil $\text{NO}_3\text{-N}$ will have a high concentration of $\text{NO}_3\text{-N}$. Evaluation of these results will determine if the amount of N fertilizer applied for the crop season was inadequate, adequate, or excessive.

COLLECTION OF THE SAMPLE

1. Collect the sample 1 - 3 weeks after black layer formation in 80% of the kernels.
2. Remove an 8 inch segment of stalk between 6 to 14 inches above ground level.
3. Collect 10 to 12 stalks taken at random throughout the field, or area sampled, and combine into one sample.
4. Remove the sheaths from the stalk.
5. Send to Olsen's Laboratory in a paper bag.

INTERPRETATION OF THE RESULTS

<u>Stalk $\text{NO}_3\text{-N}$, ppm</u>	<u>Category</u>	<u>Interpretation</u>
0 – 250	low	Consider increasing N fertilizer rate next year.
250 – 700	marginal	Consider increasing N fertilizer rate next year.
700 – 2,000	optimal	Fertilizer N rate was adequate.
2,000 plus	excess	Consider decreasing N fertilizer rate next year.

Comment: Nitrogen fertilizer applications should always be based on a soil $\text{NO}_3\text{-N}$ test, including a subsoil test for non-sandy soils. The use of the "late season" stalk test does not indicate the amount of N fertilizer that should be increased or decreased the next year, but only the adequacy of N fertilizer for the current year. Corn producers may desire to compare N rates the following year by using strip trials or sections of a field to evaluate the application rate based on the current year's stalk test result. The stalk $\text{NO}_3\text{-N}$ is probably 80 – 85% accurate in predicting the adequacy of a corn N fertilizer program.

SITUATIONS WHEN CORN PRODUCERS WHOULD USE THE STALK TEST

1. Desire to refine their N fertilizer application rates.
2. A field that received a manure application or was in alfalfa the previous year to determine if a decrease in the N fertilizer application rate affected yields.
3. If differing management practices are being evaluated, such as comparing fertilizer materials, method of application, time of application, and use of the pre-sidedress nitrate test (PSNT).