

# Guided Corn Stalk Nitrate Sampling

**A**s a corn grower, you put the fertilizer and seed into the soil and hope the two will get together.

In the past, the assumption was if you put more fertilizer in the soil, there was a better chance that the corn plant would find more of it and produce a higher yield. A high yield, then, was the measure of whether or not the grower put on enough fertilizer.

Problem with this argument is, while you may know how much grain was produced and be satisfied with that, you don't know if you could have produced more grain if more fertilizer had been available. Or conversely, you don't know that all that fertilizer was used efficiently, or whether you could have produced the same yield with less.

Stalk nitrate samples collected at the end of the season can be used to assess this. Unlike most nitrogen tests, the end of season stalk test can distinguish between adequate and varying degrees of excess nitrogen. Rather than trying to predict how much nitrogen is going to be available, it measures how much "extra" nitrogen was left in the stalk after the plant developed its grain.

The reason this works is even after the grain crop is made, the corn plant will continue to take up nitrogen and deposit it in the stalk.

## Collecting the Sample

The optimal time to collect stalk samples is after the grain reaches physiological maturity (black layer), but prior to harvest.

Collect at least 10 stalks per area sampled. The stalk samples should be 8 in. in length, cut from the stalk starting at 6 in. above the ground.

The samples are analyzed in a laboratory similar to the way soil samples are, but typically stalks have a much higher nitrate content. When combined with a GPS and carefully selected points, these sam-

ples can be extremely informative about what happened during the season.

## Aerial Imagery

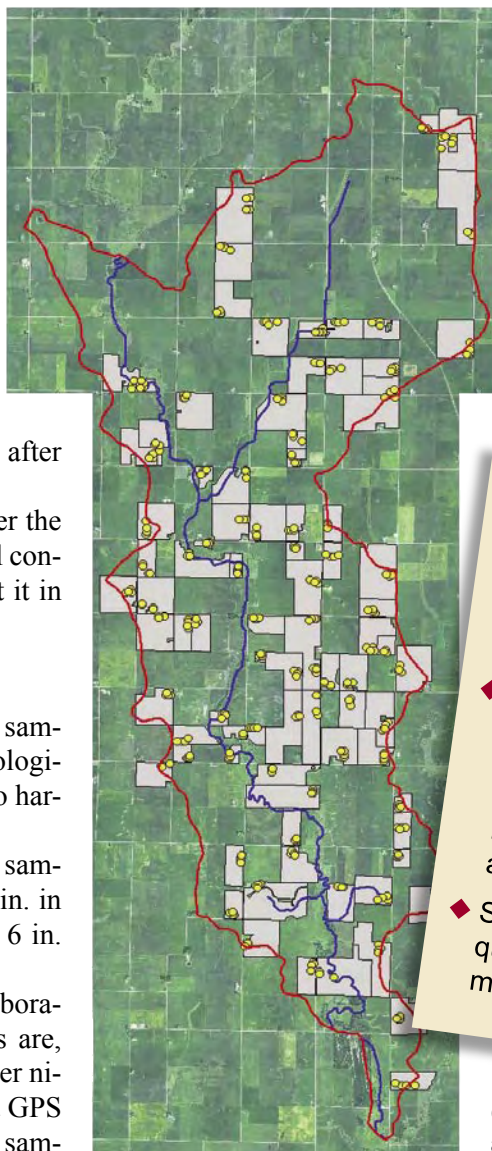
Aerial imagery can be used to help direct where to take a sample. While many types of stress affect plant color, nitrogen stress is often the reason for the lighter green or yellow that shows up in many Iowa fields.

## Soil Survey

All of the soil surveys in Iowa are digitized and are available free from your local NRCS or FSA office, or can be located on-line at a number of websites. When combined with aerial imagery, several points can be pre-selected to represent different soil types and areas that appear different based on the imagery.

## Spatial Variability

Often, nitrogen stress occurs within fields in varying degrees that do not always match pre-defined soil map units. That is why several points are selected



### Important Points:

- ◆ Stalk test results show nitrogen availability, allowing refinement of application rate or verifying that the producer got it right.
- ◆ When more producers participate in an area or watershed with similar soils, topography, weather, and practices, test results can be compiled to allow faster learning.
- ◆ Stalk testing often leads to new questions about nitrogen management.

Guided stalk sampling locations in and around West Buttrick Creek.