Fall Field Testing for Easier Spring Upkeep

The autumn, post-harvest period can be a great time to test fields for a range of nutrients and make decisions about what and when to apply inputs. Testing in the fall rather than the spring offers several potential advantages as it provides more opportunity for some nutrient applications to take effect before the start of the growing season and may allow greater flexibility in application timing.

Autumn weather conditions tend to be more favorable to sampling and timetables can be more flexible than they are in the spring. Knowing needs early may allow for inputs to be purchased in the fall when demand may be lower, which could make products less expensive. Additionally, testing facilities tend to be less busy in the fall, so wait times for lab results could be shorter.

Post-harvest soil testing should wait until soil temperature drops below 50 F to reduce the release of nitrogen and sulfur. Extra care also needs to be taken when sampling after an extremely dry period as that situation can alter potassium levels.

TESTING FOR NUTRIENTS

Although levels of nitrogen get most of the attention, especially when preparing a field for corn, it is not the only nutrient that needs to be checked when doing field testing. Other nutrients, like phosphorus (P), potassium (K), calcium (Ca), and magnesium (Mg) also are important even though these elements are more stable. When testing for less mobile elements, it is important to collect samples from a range of locations to establish a more complete understanding of the nutrient levels in different parts of the field.

Nitrogen is an important element to test for because it remains critical to corn growth and development. However, the mobility of nitrogen (NO3-N) and other elements like sulfur (SO4-S) and chloride (CL-) mean testing needs to be done every year a non-legume crop is planted.[1]

DEVELOPING A ROUTINE

It can be helpful to establish a routine for fall nutrient testing, as sampling should be done at least every two years at about the same time. Setting up a testing system helps standardize the environment generating samples, potentially providing more useful results. Testing fields regularly, in the short term, establishes how much of which nutrients may be needed for next year's crop.

In the long run, testing can help determine what nutrients are available and what that means for yield response. This information could be used to better support positive crop results. However, it can take multiple years of testing to gain the necessary understanding of the soil nutrient dynamics and production relationship.

Another element involved in establishing a testing schedule is picking a sampling method. Two common systems are grid and zone sampling.

- **Grid sampling** may be more helpful in a field that is less well known as more samples are taken, which can be a way to establish in-field variability. This method also can reduce sampling bias.
- **Zone sampling** relies on a more complete knowledge of the soil variations within a field as it breaks the area into separate zones based on soil type and unique characteristics that could influence crop growth or need specific management. Regions of fields that have a history of different fertilizer treatments, crops, yields or with different

GRID SAMPLING

ZONE SAMPLING

Grid or zone sampling is a way to understand what is going on within a field's soil.[2]

soil slope, depth, color or texture should be zoned individually. This method creates a smaller number of areas to be sampled and may support the use of variable rate fertilizer applications. Identifying and sampling from zones with different properties makes it easier to identify where specific nutrients are needed allowing for a more precise application.

With either sampling method, the important objective is to have representative samples that establish the variability within each portion of a field that will have the same management. This practice provides a better return on investment for farmers rather than treating the entire field the same way or adding more nutrients and hoping it will work out correctly. Optimizing input decisions reduces the possibility that an area is over- or under-supported and may reduce overall input costs.

[1] Bauder, Sara. "Fall soil sampling," South Dakota State University Extension. November 19, 2021. https://extension.sdstate.edu/fall-soil-sampling.

[2] Dinkins, Courtney and Jones, Clain. "Soil sampling strategies." Montana State University Extension. April 2008. https://landresources.montana.edu/soilfertility/soil-sampling-methods.html.

[3] Kaiser, Dan and Fernandez, Fabian. "Fall 2021 soil testing considerations for the 2022 growing season," University of Minnesota Extension. September 8, 2021. https://blog-crop-news.extension.umn.edu/2021/09/fall-2021-soil-testing-considerations.html.

OTHER TESTING TIPS

- **Use an appropriate sampling depth – many tests only require a soil sample of 6". But, when sampling, be sure not to remove too much surface soil before a test is made or go deeper than the tester's calibration.[3]**
- **Account for residual nitrogen – when conditions during the growing season have been dry, testing for residual nitrate in the fall can be helpful and may indicate less additional nitrogen is needed.**
- **Test for soil pH – having the correct pH in field soils protects the availability of nutrients in the soil and may allow for a reduction in applied fertilizer.**
- **There are multiple reasons to complete soil testing in the post-harvest period, including a more flexible schedule, potentially reduced-price inputs and an extended period for applications but the more important element is to establish a pattern of regular field testing. Having annual or semi-annual information about specific needs can help make input use more precise and support both short- and long-term planning.**

CORTEVA™ agriscience