

Pre-Sidedress Nitrate Test



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As I have mentioned in previous articles, nitrogen loss potential has been very low this year. Still, some people are interested in knowing how much nitrogen they should apply at sidedress. The pre-sidedress nitrogen test (PSNT), developed as a tool to determine the need for additional nitrogen, provides measures of the amount of nitrogen mineralized into plant-available forms from organic nitrogen pools plus the amount of carryover nitrogen or applied nitrogen still present in the soil. Performing the PSNT this year is not likely to tell you more than what you already know about how much N is still needed to provide a full rate. But if you consider the PSNT a necessity, take note of the following important points.

The usefulness of PSNT results can be heavily influenced by how samples are collected, handled, and processed. Even when everything is done correctly, there is still uncertainty on the utility of the information when test values are low. The PSNT is often more accurate in high-yielding environments and in fields that have received manure or other organic fertilizers in the recent past or have had legume crops with high nitrogen content, such as alfalfa. A value of 25 ppm or more is considered high and means that the probability is very small that more N needs to be applied.

Collect soil samples when corn is in the 4th- to 6th-leaf stage to a 1-foot depth at eight positions perpendicular to the direction of the nitrogen applicator. If the location of the knife application is known, start collecting there, and continue at 1/8, 1/4, 3/8, 1/2, 5/8, 3/4, and 7/8 the distance between the rows. If the location of the knife application is not known, using this same approach starting with the corn row should provide adequate sampling. Place all

eight cores in the same (large) sample bag. I suggest collecting at a density of one sample per 10 acres.

If the samples cannot be delivered to the testing lab on the day of collection, it is best to either freeze or quickly air-dry the soil. Freezing is easiest, but if drying is preferred, spread the sample on a paper, crush the cores, and use a fan to circulate air and speed the drying process. Indicate to the lab that you want nitrate nitrogen analysis so they know to dry and ground the entire soil sample before taking a subsample for analysis.

If the PSNT test values are 25 ppm or higher, there is no need for additional N; if values are 10 ppm or lower, a full rate of N is needed. For values between 10 and 25, adjust the nitrogen application proportionally.

A more practical approach than the PSNT to determining whether additional N is needed is to perform strip applications (60 to 80 lb N/acre) across the field to see if there is a response in growth or greenness. If the corn in the strips is greener or growing better, that would indicate a need to apply N to the rest of the field. Of course, the risk with this approach is that color differences may not develop until corn is in the grain-fill period, when it is too late to apply N. Another risk is that N applied late needs significant rain to move the fertilizer into the root zone, and large rain events are typically less common later in the season.

To reiterate, this year there should not be much uncertainty on how much N still needs to be applied. The potential for N loss due to weather conditions was minimal if applications were done correctly, so if you already applied the full rate, no more N should be needed. If you were planning to apply a portion at sidedress, applying it now rather than waiting is recommended. Δ

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