



## PSNT Illinois Agronomy Handbook, 24<sup>th</sup> Edition

### Pre-side-dress nitrate test (PSNT).

Work in several states has shown this test to be useful. The PSNT is typically more accurate in high-yielding environments and in fields that have received manure or other organic fertilizers in the recent past or that have had legume crops with high N content, such as alfalfa. By sampling later in the season, this test provides a measure of the amount of N mineralized from organic N plus the amount of carryover N still present in the soil. However, if late spring temperatures are below normal, the test tends to overestimate N needs (lower soil test values), probably because of slow rates of mineralization in the soil. One of the limitations of this test is that it is useful only for fields that will receive sidedress N application.

Usually a small starter rate (20 to 30 lb of N per acre) can be applied without compromising the usefulness of the test. Since N is applied at sidedress time, this brings the risks of a relatively short application window, which can be a challenge, especially in wet years, when applications may be delayed until plants are too large.

The reliability of this procedure depends heavily on ensuring that samples are collected, handled, and processed correctly. A sample to 12 inches deep is collected when corn plants are 6 to 12 inches tall (V4 to V6 development stage), or in late May to early June when planting is delayed. If the field had a history of broadcast applications, randomly collect 20 to 25 samples from an area no greater than 10 acres. If band applications of fertilizer or manure were used to fertilize the previous crops, collect at least 10 sets of three cores each between two corn rows. The first core is collected 3 inches to the right of the corn row, the second core in the middle of the two rows, and the third core 3 inches to the left of the next corn row. In all cases, place all the cores in a bucket and obtain a subsample after the cores have been thoroughly mixed. If mixing the entire sample to produce a representative subsample is too difficult, it is better to use large sample bags and keep the entire sample. Collecting a sample less than the full 12 inches or not collecting all the cores will produce unreliable results. If the samples cannot be delivered to the laboratory the same day, either freeze or air-dry the sample.

If you air-dry samples, dry them as fast as possible by spreading the samples out on a paper, crushing the cores, and blowing air with a fan. Since drying can be difficult without proper facilities, freezing samples is likely the best option for most people. Make sure to tell the laboratory that you want to measure NO<sub>3</sub> – nitrogen. If the entire sample is sent, request that the whole sample be dried and ground before a subsample is taken.

The general consensus is that no additional N is needed if PSNT test levels are above 25 parts per million, and a full rate should be applied if NO<sub>3</sub> – nitrogen levels are less than 10 parts per million.

When test levels fall between 10 and 25 parts per million, N rates should be adjusted proportionally.