

MEASURE AND MANAGE

Choosing a Sidedress N Application Rate for Corn Using PSNT

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Sidedressing Nitrogen after planting allows for more adjustments and fine tuning of Nitrogen rates. The window for collecting a Presidedress Nitrate Soil Test (PSNT) is much longer. Usually a 3 week window is available to obtain the sample and assess results.

The reliance on known yield goals is minimized. We have reasonably reliable calibration data for interpreting the test results at this time. One management consideration is to include a 30 to 40 starter rate of Nitrogen at planting time. This has resulted in consistently higher yields over many site years, as much as 8 bushels per acre. This yield advantage cannot be captured with higher rates of N at sidedress time.

The PSNT test needs to be taken anytime after corn has 4 leaves. The sample depth is 1 foot (30cm). The nitrate in rolling fields will be higher in the lower slopes. We advise taking the lower and upper slopes separately. Reduce acres per sample to 15, increasing the sample intensity provides for a better assessment of the field levels.

The following table offers the relationship between PSNT and N recommendations. With the calibration data an estimate of N response and economic gain can be determined before application takes place independently of yield goals.

Pre-Sidedress Nitrate-Nitrogen Soil test (PSNT)

PSNT ppm	Nitrogen Recommendation Lbs Actual N/ acre	Delta Yield Bushels/ acre	Fixed Application PSNT cost \$/ acre	Total N cost \$/ acre	% Return on Nitrogen
20	29	9	13.50	28.00	39
15	78	26	13.50	52.50	115
10	127	48	13.50	77.00	171
5	176	76	13.50	101.5	225

PSNT Pre-Sidedress Nitrate Soil Test

Delta Yield is the expected yield gain over using no nitrogen

Fixed Applicator Cost includes an estimated \$9.00 per acre application cost plus cost of zone mapping, PSNT sampling and lab analysis.

Total N Cost is the cost of recommended N @\$0.50 per pound actual plus fixed applicator cost.

% Return On Nitrogen is calculated at \$4.35 per bushel of corn x delta yield –Total cost of Nitrogen divided by the Total cost of Nitrogen x 100

Agri-Food Laboratories offers a detailed Variable rate N Management program based on development of Management Zones.

Management Zones are areas in the field that behave in a similar fashion. These are often related to topography, soil type and drainage patterns. A management zone must be consistent year to year. It must have attributes that can be measured and managed. We use a number of tools to determine the zones such as multiple years of normalized yield, satellite imagery or Electro Magnetic Induction mapping. Once the zones are determined we can characterize them with the PSNT. It is then possible to produce variable rate N application maps based on the zones and PSNT results.

For more information on Zone Management of Nitrogen email Jack Legg at jlegg@agtest.com or call 1-519-317-6791