



**Soil and Plant Nutrient Testing Laboratory**

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**USE THIS FORM FOR PRE-SIDEDRESS SOIL NITRATE TEST (PSNT) SAMPLES**

See the second page for a description of the test and sampling instructions. Send your sample(s), completed submission form and payment to the address listed above. Enclose check payable to UMass for \$8 per sample. Results will be returned within 48 hrs.

Grower or Consultant Name:	Telephone No:	Fax No:
Business or Farm Name:	E-mail address:	
Street Address:	<b>Method of receiving results</b> <input type="checkbox"/> US Mail (Please include \$2 (for postage & handling)) <input type="checkbox"/> E-mail	
City, State, and Zip		

LAB #	Sample ID (Field name)	Crop	Expected yield (include units)	Previous Crop or Cover-crop	Manure/compost Applied This Spring	Soil Nitrate-N (mg/kg)	Sidedress N (lbs/ac) Recommendation
<b>Lab Use only</b>	<b>Complete all information as completely as possible</b>					<b>Lab Use only</b>	
					___ Yes ___ No		
					___ Yes ___ No		
					___ Yes ___ No		
					___ Yes ___ No		
					___ Yes ___ No		
					___ Yes ___ No		

Office Use Only	
Received	Due
Check#	PO#
Cash	

Order Total \$ \_\_\_\_\_

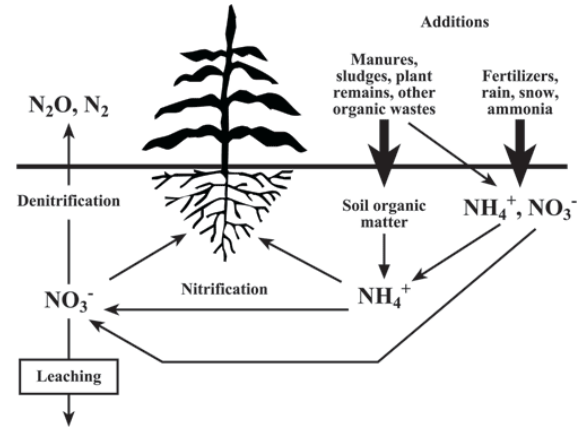
## The Pre-sidedress Soil Nitrate Test

Nitrogen is essential to nearly every aspect of plant growth. The nitrogen cycle is extremely dynamic and, as illustrated in the figure to the right, its behavior in soil is complex. Regardless of the form of nitrogen originally in or added to the soil, it undergoes many changes which determine whether it will become available to the crop, primarily as nitrate, or lost to the environment.

More than 90 percent of the total nitrogen in soil is unavailable because it is tied up in organic matter. Mineralization of organic N (conversion of organic N to inorganic N) is carried out by soil microorganisms and is extremely sensitive to soil moisture and temperature. Therefore, weather has a dramatic influence on the rate of mineralization and potential loss of available N. For these reasons, routine pre-season soil testing is not useful in humid environments for predicting nitrogen availability during the season.

Under certain conditions, in-season soil nitrate testing can be useful for predicting sidedress fertilizer N needs for a several crops in the northeast. The Pre-sidedress Soil Nitrate Test (PSNT) has been shown to successfully predict the need for sidedress fertilizer N for sweet corn, field corn, pumpkin, winter squash, and peppers where compost or manure has been applied, the previous crop was a legume, and/or the soil has a high level of organic matter. The test works best when pre-plant and starter fertilizer N rates are less than about 50 lbs N per acre.

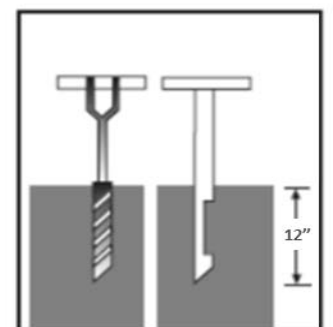
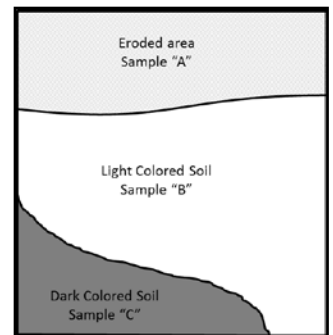
Interpretation of results from the PSNT is crop specific. For example, research in the Northeast has shown that when the soil nitrate level is above 25 ppm there is rarely an economic response to the application of sidedress fertilizer N to sweet corn and field corn. For pumpkin, winter squash, and peppers the threshold is around 30 ppm. Below the threshold levels, increasing amounts of sidedress fertilizer N are recommended. As with all soil testing, information from a PSNT should be used along with the grower's experience and knowledge of the field to determine the appropriate fertilizer application rate.



## PSNT Soil Sampling Instructions

The most critical step in soil testing is collecting the sample. It is important that you take the necessary steps to obtain a representative sample; a poor sample could result in erroneous recommendations.

- The first step is to determine the area that will be represented by the sample. Areas with different yield potential due to past management or differences in soil type should be sampled separately. It may be helpful to draw a map of the field and identify areas where you will collect samples.
- Samples should be collected about one week prior to the appropriate time for sidedressing. For field corn and sweet corn, samples should be collected when plants are 10- to 12-inches tall at the whorl. Using a clean bucket and an auger or sampling tube collect at least 15 to 20 soil cores to a depth of 12- inches. Avoid starter bands and atypical areas of the field.
- Next, break up soil cores, remove stones and plant debris, and **thoroughly mix** the sample in the bucket and scoop out approximately one cup of soil to submit to the lab. Microbial activity can rapidly change the concentration of nitrate in warm, moist soils, so it is important to rapidly dry samples. Samples can be dried by spreading them in a thin layer on a sheet of non-absorbent paper. A fan set on low will help speed the drying process.
- Place the **dry sample** in a UMass Soil Testing Laboratory carton (obtained from the lab) or a plastic zip-lock bag. Label each box or zip-lock bag with your sample ID (e.g. field name). Hand deliver or mail your sample(s), completed submission form and payment to the address listed on the front. Enclose check payable to UMass for \$8 per sample.



Results are generally available within 24 to 48 hrs. Be sure to provide your preferred method of receiving results and appropriate contact information.