

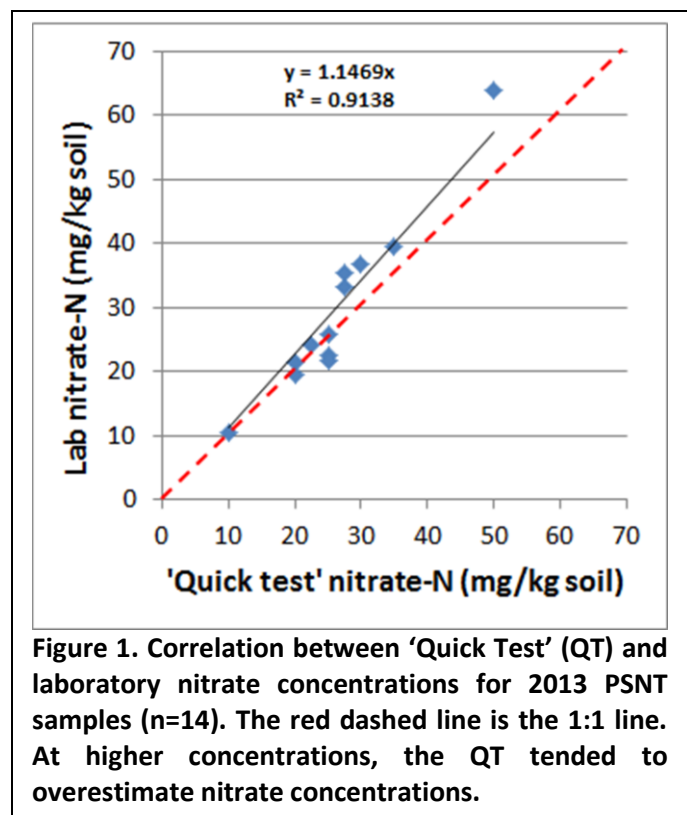
Using the Pre-Sidedressing Soil Nitrate (PSNT) 'Quick Test' to Guide N Fertilizer Management in Sweet Corn

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The following is a method for cheaply and quickly determining a soil's nitrate status for the purpose of determining the midseason sidedress fertilizer rate for sweet corn. For information on the pre-sidedress nitrate test (PSNT), see OSU's nutrient management guide EM 9010-E (Sweet Corn- Western Oregon). The 'Quick Test' (QT) has been in use for years in the Salinas Valley of California with good results. Compared to a traditional laboratory test, it is cheaper and test results can be obtained within hours of sample collection. Although this method is semi-quantitative, results from the QT are well correlated with laboratory results (See Fig. 1). Ultimately this test is only as good as the soil sample collected.

Procedure

- 1) Make the extracting solution by dissolving approximately 6 grams of calcium chloride (~1 teaspoon) in a gallon of distilled water. The calcium will help to settle out the suspended clay particles.
- 2) Fill a volumetrically marked tube or cylinder to the 30 ml level with the extracting solution. Any volumetrically marked tube or cylinder will work, but 50 ml plastic centrifuge tubes are convenient and reusable.
- 3) Add well homogenized soil to the tube until the solution rises to 40 ml. Cap tightly and shake vigorously until all soil clods are broken down and dispersed. For moist clay soils that may be difficult to blend, pinch off small pieces of each soil core to get a representative sample.
- 4) Let the samples sit until a clear zone at the top of the tube forms. This may take a few minutes for a sandy soil up to an hour for clay soils.
- 5) Dip an EM Quant™ nitrate test strip into the clear zone of the solution, shake off excessive solution, and wait 60 seconds. The strip color will continue to darken with time, so make the determination between 60-70 seconds after dipping the strip. Compare the color that has developed on the test strip with the color chart provided. When the strip color is between two color samples on the chart, interpolate the nitrate concentration of the strip as closely as possible. When in doubt, be conservative and go lower than higher. **Note: Store the test strips in the fridge when not in use.**



How to use the results

The nitrate test strips are calibrated in parts per million (ppm) NO₃. Conversion to ppm NO₃-N in dry soil requires dividing the strip reading by a correction factor based on soil texture and moisture content:

strip reading ÷ correction factor = ppm NO₃-N in dry soil

Soil texture	<i>Correction factor</i>	
	Moist Soil	Dry soil
sand	2.3	2.6
loam	2.0	2.4
clay	1.7	2.2

Once you have the corrected value, use Table 10 in OSU's nutrient management guide EM 9010-E (Sweet Corn- Western Oregon) to determine the sidedress rate

Obtaining the required materials

The following items can be purchased online. An internet search will identify choice of vendors.

- Centrifuge tubes (50 ml): can be purchased from many vendors in packages as few as 10.
- Calcium chloride: used in food processing and can be purchased from home canning supply stores.
- EM Quant™ nitrate test strip: various vendors. Current cost is **~\$70/100 strips**

If you are interested in trying this method, please contact me at heinriaa@oregonstate.edu and I can provide you with some 50 ml centrifuge tubes and calcium chloride.