

Soil Nitrate-Nitrogen Quick Test

Supplies needed for this test:

1. Two 50 ml centrifuge tubes/individual field
2. 5.6 grams of Calcium Chloride to be added to 1 gallon of distilled water
3. Merckquant Nitrate test strips

Procedure:

1. Collect 8-10 random samples from the field. Collect core samples to a depth of 12 inches (active root depth). Do Not include top 2 inches of soil since it may be high in N but too dry for active root growth. Mix samples thoroughly in a bucket.
2. Fill tube to the 30 ml level with calcium chloride solution.
3. Add soil to the tube until the level rises to 40 ml. Cap tube and shake vigorously. Let sit until particles settle out. Time will vary depending on clay content.
4. When solution is reasonably clear dip test strip into the solution for 1 second, shake off excess, and wait 60 seconds. Compare color with color chart.
5. To minimize variability run two replications.

Interpretation/Calculations: (mg/l is the same as ppm, 1:1)

1. The test strips measure NO_3 ppm in the solution. To approximate conversion of reading to ppm $\text{NO}_3\text{-N}$ for dry soils requires a correction factor based on soil texture and moisture. Use the formula \Rightarrow **Test strip reading (ppm NO_3) \div correction factor = ppm $\text{NO}_3\text{-N}$ in dry soil**

example: You get a test strip reading of 30 ppm NO_3 and your ground is moist sandy loam (~2.15)
Your $\text{NO}_3\text{-N}$ in dry soil would be **13.9 ppm**

Correction Factor		
Soil Texture	Moist Soil	Dry Soil
Sand	2.3	2.6
Loam	2	2.4
Clay	1.7	2.2

NOTE: Soils less than 10 ppm $\text{NO}_3\text{-N}$ would be considered quite low, levels above 20 ppm would have enough available nitrogen to meet immediate crop needs. Caution: low soil $\text{NO}_3\text{-N}$ values late in the cropping season may not indicate insufficient nitrogen; it may just indicate highly efficient crop uptake. Tissue testing (petiole sample) would be required to confirm low nitrogen status.

2. Use the number generated in step 1 (13.9) to convert Nitrate-N in the soil to existing pounds of available nitrogen/acre in a 12" sample. To do this multiply the correction factor by 4..... $13.9 \times 4 =$ **55.6 pounds of nitrogen per acre available to your crop**

NOTE: If you take soil samples to a depth of 6 inches instead of 12 inches (as described above) you will need to multiply your reading by 2 instead of 4.

Nitrate Test Strips: Ben Meadows at 1-800-241-6401, Catalog #4JB-7830, \$50/100 strips

Calcium Chloride: VWR Scientific at 800-932-5000, Part #JT1332-1, \$55 for **500** grams (I have this available for free)

Centrifuge Tubes: VWR Scientific at 800-932-5000, Part #20171-034, \$103 for **500** 50 ml tubes (I have these available for free)

Soil Probe: JMC Soil Investigation Equipment at 800-247-6630, Part #031 (12" samples), \$60

Ben Meadows (same contact information as above) Catalog #4JB-220106, \$68

For assistance contact: Terry Hall, USDA Natural Resources Conservation Service, 1-831-637-4360 extension 111
Tom Lockhart, Cachuma Resource Conservation District, 1-805-928-9269 extension 110