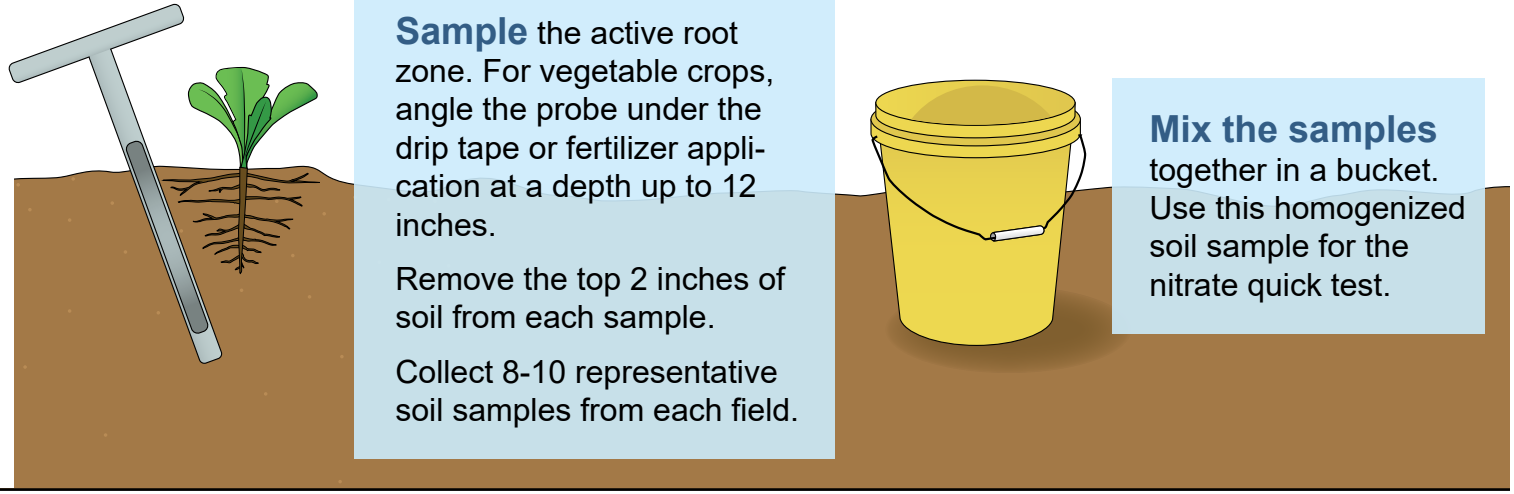
Soil Sampling and Nitrate Quick Test

Supplies

1. Soil probe or trowel
2. Buckets
3. Distilled water
4. Calcium chloride ($CaCl_2$)
5. 50 ml centrifuge tubes
6. Nitrate quick test strips



Sample the active root zone. For vegetable crops, angle the probe under the drip tape or fertilizer application at a depth up to 12 inches.

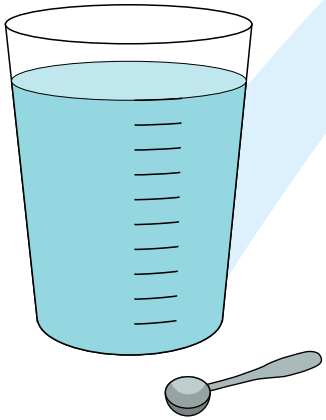
Remove the top 2 inches of soil from each sample.

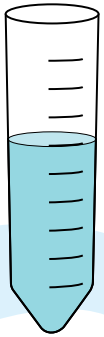
Collect 8-10 representative soil samples from each field.

Mix the samples together in a bucket. Use this homogenized soil sample for the nitrate quick test.

Nitrate Quick Test

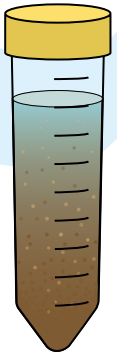
1 **Create solution.** Add 5.6 grams (about 1 tsp) of calcium chloride to 1 gallon of distilled water.

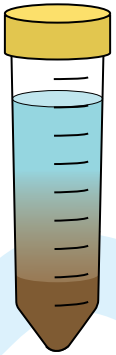




2 **Prepare test tube.** Add 30 ml of solution to a 50 ml centrifuge tube.

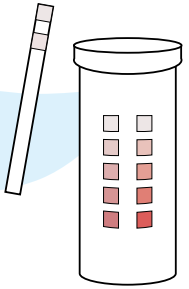
3 **Add soil and shake.** Add soil sample to the tube until solution rises to 40 ml. Cap tube and shake vigorously.





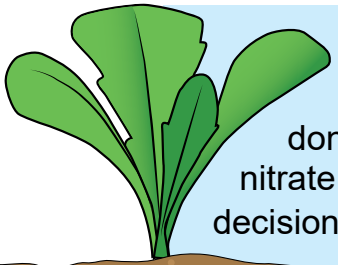
4 **Wait.** Let solution sit until particles settle. Time will vary depending on clay content of soil.

5 **Test.** Dip test strip into clear solution for 1 second. Shake off excess water and wait 60 seconds. Compare color to color chart.



Flip the page to see how to interpret the results.

Interpreting Results of the Soil Nitrate Quick Test



The in-field nitrate quick test (NQT) is a cost-effective tool to determine residual soil nitrate concentration. When done correctly, the test provides an estimate of residual soil nitrate, which can be used to improve fertilizer management decisions to meet crop needs.

How much nitrogen (N) is available to your crop?

Nitrate test strips may be calibrated for different nitrogen compounds. Note, mg/l (milligrams per liter) is the same as parts per million (ppm), 1:1. If the nitrate test strips measure nitrate (NO_3) ppm, find the nitrate-nitrogen (NO_3-N) ppm for dry soils with a correction factor based on soil texture and moisture. Use the formula:

Test strip reading (NO_3) ÷ correction factor = ppm NO_3-N in dry soil

Correction Factors

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

Example

You have a test strip reading of 30 ppm NO_3. The soil is moist sandy loam (Average 2.3 and 2 to get 2.15). Your NO_3-N in dry soil would be:

30 ppm NO_3 ÷ 2.15 = 13.9 ppm NO_3-N

Meaning of the result

Soils with less than 10 ppm NO_3-N are considered low. Levels above 20 ppm show that there is available nitrogen to meet immediate crop needs.

However, late in the season, low soil NO_3-N values may not indicate insufficient nitrogen. Low NO_3-N may indicate efficient crop uptake or movement of nitrate below the sampled layer of soil. Tissue testing (petiole sample) may help to confirm nitrogen status.

Use the generated number to convert nitrate in the soil to existing pounds (lbs) of available nitrogen per acre. If you take soil samples to a depth of 6 inches, multiply your reading by 2. If your soil samples were taken at 12 inches, multiply the number (13.9 in the example) by 4:

13.9 x 4 = 55.6 lbs nitrogen/acre available to your crop

Nitrate measurements may change depending on soil texture, precipitation and irrigation. By becoming familiar with the NQT, you can confidently make efficient changes to your fertilization plan.

More NQT information

See details about NQT supplies and process at:
www.cdfa.ca.gov/is/ffldrs/frep/Resources.html

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