

Reducing Fertilizer Applications Using the Nitrogen Quick Test in Lettuce



Farm Water Quality Management Plans for Vegetable Farms



Mapping the Drainage



Farm Water Quality Management Plan for 2005

| Ranch | Year | Operation | Completed |
|-------|------|---------------------------------------|-----------|
| 1 | 2005 | Rye grass on ditch in Plot 11 | |
| 2 | 2005 | Plastic drops in 22 & 23 | |
| 2 | 2005 | Reduce leaks & 8 foot perforated pipe | |
| 3 | 2005 | 100% Drip | |
| 3 | 2005 | Wooden dams on 33 | |
| 3 | 2005 | Culverts between 35 & 36 | |
| 3 | 2005 | Leveling on west side of 36 | |
| 4 | 2005 | Steel drainage pipes on 41 - 44 | |
| 4 | 2005 | 100% drip | |
| 4 | 2005 | Culverts between 41 & 42 | |
| 5 | 2005 | Need to improve the dam on 51 | |
| 6 | 2005 | 66 100% drip | |
| 6 | 2005 | Clean sump | |
| 6 | 2005 | Level 62 & 63 | |
| 7 | 2005 | 77 and 715 100% drip | |
| 7 | 2005 | 79 & 714 half check dams | |
| 7 | 2005 | 72 & 79 rye seed grass | |
| 7 | 2005 | 79 drop box | |
| 8 | 2005 | Slow release fertilizer | |

PSSNQT



• Soil NO₃-N “Quick Test” Protocol

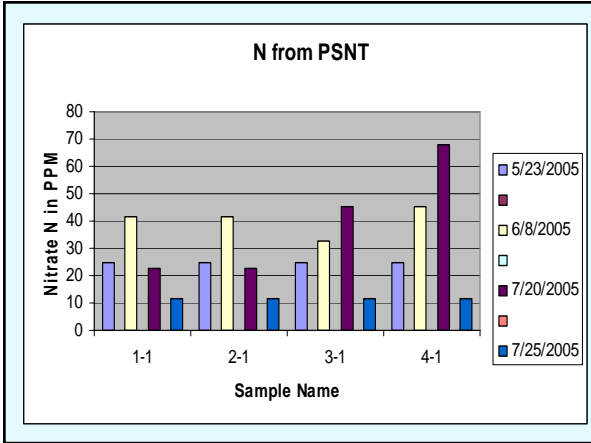
- This test is provided to enable growers, fertilizer sales personnel and crop consultants to become familiar with the soil quick test. This test is designed to provide rapid results on the amount of residual nitrate-nitrogen present in the soil and available for immediate crop needs. It is designed to be used, prior to a nitrogen fertilizer application, and specifically prior to a midseason side-dress application.
- Supplies Needed For This Kit:**
 - Six 50 ml centrifuge tubes.
 - 5.6 grams of Calcium Chloride to be added to a 1 gallon of bottled distilled water, which will make a 0.01 M Calcium Chloride solution.
 - Merckquant test strips in tubes of 100 can be purchased from Ben Meadows at 1-800-241-6401. Order the 0-500 mg/l NO₃ strips – catalog #7830.
- Procedure:**
 - Collect a composite soil sample that represents the active root zone of the crop. A composite sample will include 8 to 10 sub-samples from one field or field portion. These sub-samples should be thoroughly mixed together. Soil samples should be collected from below the seed-line and from the top 12 inches of soil. Blend the sample thoroughly in a container, such as a bucket. Don't include the top 2 inches of soil since it may be high in N but too dry for active root growth.
 - Fill a volumetrically marked tube or cylinder to the 30 ml level with 0.01 M calcium chloride (CaCl₂) solution.
 - Add soil to the tube until the liquid level rises to 40 ml; cap tightly and shake vigorously until soil is dispersed. Let sit until soil particles settle out.
 - When solution is reasonably clear, dip Merckquant nitrate test strip into the solution, shake off excess solution, and wait 60 seconds. Compare color with the color chart provided.
 - To minimize variability inherent in soil sampling, run duplicate samples for each field evaluated.
- Interpretation**
 - The test strips are calibrated in parts per million (PPM) NO₃. The approximate conversion to PPM NO₃-N on a dry soil basis will require dividing by a correction factor based on soil texture and moisture:
 - Strip reading (PPM NO₃) / correction factor = PPM NO₃-N in dry soil
 - Correction factor—

| Soil Texture | Moist Soil | Dry Soil |
|--------------|------------|----------|
| Sand | 2.3 | 2.6 |
| Loam | 2.0 | 2.4 |
| Clay | 1.7 | 2.2 |
 - Soil less than 10 PPM NO₃-N would be considered low; levels above 20 PPM NO₃-N have enough available N to meet immediate crop needs.
 - For more information contact: Tom Lockhart, Cachuha Resource Conservation District, (805)928-9269 x110



Lettuce Crop

- 5/9 Preplant Soil Sample Measured 15 ppm N
- Preplant Fertilizer Added 21 lbs N
- 5/14 Plant Seed
- 6/8 Quick Test Measured 30 ppm N
- 6/16 2nd Knife Added (70 lbs N)
- 6/17 Quick Test Measured 22 ppm N
- 6/20 Fertigate Added 64 lbs N
- 6/30 Quick Test Measured 10 ppm N
- 7/6 Fertigate Added 64 lbs N
- 7/18 Start Harvesting



Lettuce Nitrogen Requirement

- Early Growth = 5-10 lbs/acre/week
- Cupping = 10-20 lbs/acre/week
- Head Filling = 15-30 lbs/acre/week
- 9 week crop = 90 – 180 lbs N/season
- Reported by UC Publication



Early Growth 5-10 lbsN/wk



Cupping 10-20 lbsN/wk



Head Filling 15 to 30 lbN/wk



Check Irrigation Water for Nitrate



Mobile Irrigation Lab



Lettuce Germination with Drip



Lettuce Germination with Buried Drip Tape



Lettuce Germination with Drip (buried)



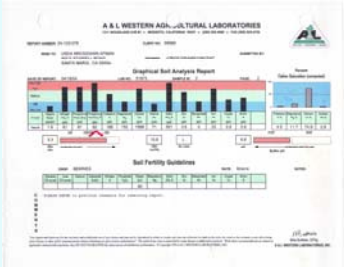
Tailwater Retention



Tailwater Return



Preplant Soil Sampling



Drop Box Inlets



Grassed Waterway



Grassed Waterway



Cover Cropping



Good Water Quality

