United States Department of Agriculture
Natural Resources Conservation Service 2012 Ranking Period 1

Water Quality and Air Quality Enhancement Activity – WQL25 – Split applications of nitrogen based on a PSNT

Enhancement Description
Use pre-sidedress soil nitrate test (PSNT) to determine the need and/or amount of additional nitrogen to be applied during a sidedress/topdress N application.

Land Use Applicability
Cropland

Benefits
Efficient use of nitrogen (N) fertilizer is important for economical crop production as well as water and air quality enhancement. Split sidedress or topdress applications of fertilizer N improve the efficiency of nutrient uptake and protect water and air resources. Pre-plant soil test nitrogen analysis (not to be confused with PSNT) can be poorly correlated with growing season soil N availability and often does not provide sufficient insight upon which to base sidedress or topdress N applications. Additionally, sidedress or topdress applications of N based on a PSNT may lower the total amount of fertilizer applied, including ammonia fertilizer, minimizing ozone damage and greenhouses gases. Nitrate, while required by plants as a nutrient, is unstable in soil and can move with water through the soil into surface and ground water. Using split applications of N based on a PSNT will minimize nitrate contamination of surface and ground water, improve N use efficiency, and reduce harmful N emissions, improving the overall greenhouse gas footprint.

Conditions Where Enhancement Applies
This enhancement applies to all annually planted crop land use acres in states where a Land Grant University approves the methodology.

Criteria
Conduct a **PSNT** on the selected crop (e.g. corn) to test if additional N fertilizer is needed (sidedress application) on fields with a history of manure application, sewage sludge, or other residual organic products or where a legume crop or a legume cover crop has been grown.

The PSNT attempts to:

a. Gauge the pool of potentially mineralizable organic N in the top foot of soil, and
b. Link that pool with a likelihood of a yield response from additional N fertilizer at sidedressing time.

Adoption Requirements
This enhancement is considered adopted when a PSNT has been conducted on the land use acre.

Documentation Requirements

Written documentation for each year of this enhancement describing the following items:

1. A map showing where the enhancement is applied,
2. Recommendations from the test,
3. Dates of split nutrient applications,
4. Type(s) of nutrients (fertilizer and organic) applied including rate, form and timing,
5. Treatment area(s),
6. Soil test results,
7. Crops grown and yields (both yield goals and measured yield), and
8. Calibration of application equipment.

Note: In lieu of documenting each individual item listed in the Documentation Requirements, a Certified Crop Advisor plan that contains each of the items may be substituted.

Michigan Supplement

WQL25

For the Pre-sidress Soil Nitrate Test (PSNT), refer to the report, "Soil nitrate test for corn in Michigan", by Darryl Warncke, Michigan State University (MSU). The pdf file of this report, titled "PSNT for Corn in MI", can be found in Section IV of the Field Office Technical Guide, G. Technical Tools, Nutrient Management, in the folder Nutrient Management References.

For nitrogen management recommendations follow:

- MSUE Publication E2904, Nutrient Recommendations for Field Crops in Michigan
- MSUE Publication E2934, Nutrient Recommendations for Vegetable Crops in Michigan.
- MSUE Publication E-852, Fertilizing Fruit Crops