NUTRIENT MANAGEMENT PLAN
SUPPLEMENTAL INFORMATION
(INORGANIC SOURCES ONLY)

N.C. Practice Job Sheet: NC-590-INORG
(December 2006)

Prepared for:_____

By:_____

Farm:_____ Tract:_____ Date:____/____/____

WHAT IS NUTRIENT MANAGEMENT?

The conservation practice, Nutrient Management, is managing the amount, source, placement, and timing of the application of nutrients and soil amendments to achieve realistic production goals, while minimizing nutrient movement to surface or ground waters. This practice is accomplished through a Nutrient Management Plan, which is normally part of a broader Conservation Plan that addresses multiple resource concerns.

PURPOSE OF NUTRIENT MANAGEMENT

Your nutrient management plan is intended to accomplish one or more of the following objectives:

- To budget and supply nutrients for plant production.
- To minimize the delivery of agricultural nutrients to surface and ground water resources.

CONTENTS OF THE NUTRIENT MANAGEMENT PLAN

The information provided in this Job Sheet and the attachments meets the minimum requirements for a Nutrient Management Plan for USDA-NRCS purposes. This Nutrient Management Plan includes:

1. A plan map and soils map for the area planned (these may be part of the overall Conservation Plan).
2. Location of designated sensitive areas or resources (streams, wells, sinkholes, etc.) and any associated nutrient application setbacks, etc.
3. Your planned crop rotation.
4. Results of soil, plant, water tests.
5. Results from Phosphorus Loss Assessment Tool (PLAT) or Leaching Index (LI) if applicable.
6. Realistic yield expectations for the crops in the rotation, and their source if other than default values approved for N.C.
7. Recommended nutrient application rates for nitrogen, phosphorus, and potassium, as well as timing, form, and method of application and incorporation, if applicable. Information may be included on determining allowable nutrient application rates based on annual changes to crop rotations.
8. This Job Sheet (or comparable information), that provides the following:
   - General requirements of this practice, as well as additional requirements to meet the natural resource protection purposes listed above.
   - Additional considerations specific to this plan.
   - Operation and maintenance information for this practice.

This plan was developed based on the current NRCS 590 standard and Federal, state, or local regulations or policies. Changes in laws or regulations may require a plan revision.

BASIC REQUIREMENTS

General

Application of nutrients must comply with all applicable Federal, state, and local laws and regulations.

The realistic yield expectations (RYEs) in this plan are based on one or more of the following:

- Default values approved by the N.C. Interagency Nutrient Management Committee that incorporate soil productivity information, yield data, and research with North Carolina soils, and cropping systems. Additional information on the default values may be found at:

http://www.soil.ncsu.edu/nmp/yields

- Documented actual yield data from the site, determined by the average of the highest three yields of the last five consecutive specific crop harvests. (For forage crops, determine the average of the highest three years of the last five years.)
- A fertilization rate recommended by North Carolina State University may be used in cases where no yield data or approved RYE values exist for a crop.
- An RYE inferred from a similar crop on a soil with similar physical and chemical features may be used for new crops or in the absence of other RYE data. This inferred RYE may ONLY be specified by a certified Nutrient Management planner.

Erosion, runoff, and water management controls have been planned, as needed, on fields that receive nutrients.

Soil Testing

This nutrient management plan has been developed based on current soil test results (no older than three years).

Soil samples must be collected and prepared in accordance with North Carolina State University or the North Carolina Department of Agriculture and Consumer Services (NCDA&CS) Agronomic Division standards or recommendations.

Soil test analyses can be performed by any laboratory or program that is certified by the North Carolina Department of Environment and Natural Resources (NCDENR), Division of Water Quality, Laboratory Section.

NCDA&CS Agronomic Division uses the Mehlich-3 extractant process for soil testing. Growers who utilize other laboratories must request the use of the Mehlich-3 methodology to ensure the test results are compatible with North Carolina's nutrient management planning and assessment tools. For statewide consistency, all laboratories used must provide fertilization recommendations using guidelines and methodologies as referenced at the NCDACS website:

http://www.ncagr.com/agronomi/obook.htm

Growers are encouraged to use a laboratory that is supported by field research within the state.

Soil testing shall include analysis for all nutrients for which specific information is needed to develop the nutrient plan.

Plant Tissue Testing

Tissue sampling and testing, when used, shall be done in accordance with North Carolina State University or NCDA&CS standards or recommendations.

Nutrient Application Rates

Recommended nutrient application rates are based on North Carolina State University or NCDA&CS recommendations that consider current soil test results, RYEs, and management.

Liming material shall be applied as needed to adjust soil pH to the specific range required by the crop or crops in the rotation for optimum availability and utilization of nutrients.

The planned rates of nutrient application are shown on the attached sheets. These rates have been computed as follows:

- **Nitrogen Application** - Planned nitrogen application rates match, as closely as

possible, the recommended rates using the RYE for the site.

- **Phosphorus Application -** Planned phosphorus application rates match the soil test recommended rates as closely as possible.
- **Potassium Application** – Planned potassium application rates match the soil test recommended rates as closely as possible. (This is particularly critical in situations where a potentially harmful nutrient imbalance in crops or forages may occur, such as grass tetany).
- **Other Plant Nutrients -** The planned rates of application of other nutrients if applicable are consistent with North Carolina State University or the NCDA&CS guidelines or recommendations.
- **Starter Fertilizers** - Starter fertilizers containing nitrogen, phosphorus and potassium must be applied in accordance with North Carolina State University or the NCDA&CS guidelines or recommendations. When starter fertilizers are planned, they shall be included in the nutrient budget.

Nitrogen, phosphorus, or potassium application may exceed recommended rates only when custom blended commercial fertilizers are not available. Several sources of varying analysis fixed-ratio fertilizers should be used whenever possible to match the specified application rate as closely as possible. Exceeding the recommended nutrient rates (from soil test/RYE) using inorganic fertilizer on a long-term or continuous basis is not considered acceptable.

Based on the planned application rates, no environmentally harmful increase in soil phosphorus is expected.

Nutrient Application Timing

Timing of nutrient application shall correspond as closely as possible with plant nutrient uptake characteristics, while considering cropping system limitations, weather and climatic conditions, and field accessibility. Nutrients shall not be applied to frozen, snow-covered, or saturated soil.

Plan Review and Revision Period

A thorough review and revision (if needed) of the nutrient management plan shall be conducted on a regular cycle, not to exceed five years.

ADDITIONAL REQUIREMENTS FOR MINIMIZING DELIVERY OF NUTRIENTS TO SURFACE AND GROUND WATER

In areas that have been identified as impaired with agricultural nutrients being a likely source, an assessment shall be completed of the potential for nitrogen or phosphorus transport from the site, even when no manure or organic by-products are being applied. (The streams/water bodies in this category are listed in the USDA-NRCS Field Office Technical Guide, Section I and are also available in the NCANAT software.) NCANAT is available for download from the NC Nutrient Management website: *http://nutrients.soil.ncsu.edu/*

☐ **NO**

This nutrient management plan **IS NOT** in an area where surface waters are impaired, with agricultural nutrients identified as a likely source. No additional assessments are required.

☐ **YES**

This nutrient management plan **IS** in an area where surface waters are impaired, with agricultural nutrients identified as a likely source. The following assessments are required and have been included in this plan:

____ Phosphorus Loss Assessment Tool (PLAT). (Only required if soil test P-I > 50.)

____ Leaching Index (LI). (Only required if soil site conditions indicate a potential for leaching)

While the results of these assessments do not affect your planned nutrient application rates, some additional conservation practices may

be specified in the plan to reduce the risk of nutrient movement from the field, if applicable.

IMPORTANCE OF MANAGING NUTRIENTS

Nitrogen and phosphorus are water soluble elements and either or both may be components of inorganic fertilizers. In soluble forms, both can move with water as leachate down through the soil, or over the soil surface as runoff after rainfall. While nitrogen and phosphorus exist in different forms and may move through different transport processes on the same site, they both can have detrimental effects on both surface and shallow ground water quality. As an example, excess nutrients can result in accelerated eutrophication with severe algal blooms and fish kills.

Because of the topography, hydrology, and other factors in the state, the environmental problems from excess nutrients reaching surface water may not be exhibited near the contributing source, but rather create water quality problems far downstream. Consequently, the Neuse River Basin, Tar-Pamlico Basin, the Chowan River, the watershed of the B. Everett Jordan Reservoir, and the watershed of the New River in Onslow County are listed as Nutrient Sensitive Waters in North Carolina.

Nitrogen: Nitrogen applied as fertilizer is transformed into nitrate and can move with the water moving downward into the shallow ground water and eventually to surface waters. (Relatively small amounts of nitrogen reach our surface waters through rainfall runoff.) The Leaching Index (LI) is a required part of the nutrient management plan in some areas of the state with surface water impairments. The LI uses soils information and local climate data to assess the potential hazard from leaching of nutrients. The results of the LI analysis and recommended actions are included in your nutrient management plan, if applicable.

Phosphorus: Research in recent decades indicates that, with high soil phosphorus levels, phosphorus has more potential to be transported off-site than recognized in the past. Phosphorus can be transported in several ways: (1) attached to soil particles leaving the field through erosion, (2) in soluble form leaving the field in surface runoff, and (3) in soluble form leaching downward through the soil profile, and eventually into surface water. Unlike nitrogen, the most likely transport pathway for phosphorus varies by site, and depends upon such factors as soil erosion rate, soil phosphorus levels, texture of soils, existence of buffers, and other factors. In N.C., PLAT (an application within NCANAT) is the tool used to assess potential excessive phosphorus losses. The results of the PLAT analysis and recommended actions are included in your nutrient management plan, if applicable.

OPERATION & MAINTENANCE

You are responsible for safe operation and maintenance of this practice, including all equipment. The following Operation & Maintenance should be conducted:

1. Review the plan annually to determine if adjustments or modifications to the plan are needed. Information may be provided in the plan to determine nutrient application rates based on annual adjustments to crop rotations. This nutrient management plan will be thoroughly reviewed every five years and revised if necessary. The next review will be performed in _____.

2. Protect fertilizer storage facilities from weather and accidental leakage or spillage. Surface water should be diverted from the structure and walls and roof should be waterproof.

3. Ensure proper calibration of application equipment to ensure uniform distribution of material at planned rates.

4. Records should be maintained for five years, or for a period as required by other Federal, state, or local ordinances, or program or contract requirements. To ensure adequate information exists to support sound nutrient management, NRCS recommends the following records be included:

- Soil test results and recommendations for nutrient application,
- Quantities, analyses and sources of nutrients applied (When the actual rates used exceed the recommended and planned rates on inorganic fertilizer plans, records should indicate the reasons for the differences, e.g. inability to acquire custom blended fertilizer.)
- Dates and method of nutrient applications,
- Crops planted, planting and harvest dates, yields, and crop residues removed,
- Results of water, plant, and organic by-product analyses, and
- Dates of review and person performing the review, and recommendations that resulted from the review.

  NOTE: State laws or regulations may define record-keeping requirements for some operations.

5. Ensure that workers are protected from and avoid unnecessary contact with inorganic fertilizers. Protection should include the use of protective clothing when working with plant nutrients. Extra caution must be taken when handling ammonia sources of nutrients.
6. The disposal of material generated by the cleaning of nutrient application equipment should be accomplished properly and in accordance with applicable state and local guidelines. Excess material should be collected and stored or field applied in an appropriate manner. Excess material should not be applied on areas of high potential risk for runoff or leaching.

ADDITIONAL REQUIREMENTS OR OPERATION & MAINTENANCE INFORMATION

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