

## Part 402 - Nutrient Management

### 402.1 Policy

- A. The guidance and procedures contained in this section are applicable to all technical assistance that involves nutrient management and/or the utilization of organic by-products, including animal manure, where nutrients are applied to the land. All NRCS employees will follow these procedures when providing such technical assistance. Third party vendors and other non-NRCS employees will use these procedures when assisting with the implementation of federal conservation programs for which NRCS has national technical responsibility and that include plans for nutrient management.
- B. Plans for nutrient management are developed in compliance with all applicable Federal, state, and/or local regulations. Federal, state, and/or local regulations take precedence over NRCS policy when more restrictive.
- C. NRCS at the state level will supplement this guidance to make it applicable to local conditions as appropriate.

### 402.2 Definitions

- A. The following definitions apply to terms used in this section.
  - (1) Conservation Management Unit (CMU): A field, group of fields, or other land units of the same land use and having similar treatment needs and planned management. A CMU is a grouping by the planner to simplify planning activities and facilitate development of conservation management systems. A CMU has definite boundaries, such as fence, drainage, vegetation, topography, or soil lines.
  - (2) Nutrient: Any of the elements considered essential for plant growth, particularly the primary nutrients; nitrogen, phosphorus, and potassium.
  - (3) Nutrient Management: Managing the amount, source, placement, form, and timing of the application of nutrients and soil amendments to ensure adequate soil fertility for plant production and to minimize the potential for environmental degradation, particularly water quality impairment.
  - (4) Nutrient Management Plan: A documented record of how nutrients will be used for plant production prepared for reference and use by the producer or landowner.
  - (5) Nutrient Management Specialist: A person who provides technical assistance for nutrient management and has the appropriate certification.
  - (6) Nutrient Source: Any material (i.e. commercial fertilizer, animal manure, sewage sludge, irrigation water, etc.) that supplies one or more of the elements essential for plant growth.
  - (7) Other Organic By-product: Any organic material other than animal manure, sewage sludge, or urea applied to the land (e.g. food processing waste).
  - (8) Resource Management System (RMS): A prescribed combination of conservation practices and management identified by land or water uses that, when implemented, prevents resource degradation and permits sustained use by meeting quality criteria established in the FOTG for the treatment of soil, water, air, plant, and animal resources.

(9) Third Party Vendor: An individual (excluding NRCS employees, extension specialists, and conservation district employees) who has been certified by an approved certification organization as being qualified to provide specified types of conservation assistance, and whose certifying organization participates in the USDA Approved Vendor Process outlined in Part 504, "Conservation Assistance from Third Party Vendors" of the NRCS Conservation Programs Manual. Third Party Vendor certification programs may include, but are not limited to:

- (i) Certified Crop Advisor Program of the American Society of Agronomy.
- (ii) Land Grant University certification programs.
- (iii) National Alliance of Independent Crop Consultants.

### **402.3 Certification**

- A. All persons who review or approve plans for nutrient management will be certified through a certification program accepted by NRCS in the state involved.
- B. NRCS should identify all certification programs, available within the state, it judges to be acceptable methods for becoming certified.
- C. USDA recognized programs for certifying third party vendors are recommended for use in states that have or use no other recognized certification program.

### **402.4 Nutrient Management Plans**

- A. Plans for nutrient management may be stand alone or be elements of a more comprehensive conservation plan. When plans for nutrient management are part of a more comprehensive conservation plan, the provisions for nutrient management are compatible with other provisions of the plan.
- B. Plans for nutrient management are developed in accordance with technical requirements of the NRCS Field Office Technical Guide (FOTG), policy requirements of the General Manual, procedures contained in the National Planning Procedures Handbook (NPPH), and technical guidance contained in the National Agronomy Manual (NAM).
- C. Plans for nutrient management will include the following components, as applicable:
  - (1) Aerial site photographs or maps and a soil map.
  - (2) Current and/or planned plant production sequence or crop rotation.
  - (3) Soil test results and recommended nutrient application rates.
  - (4) Plant tissue test results, when used for nutrient management.
  - (5) A complete nutrient budget for nitrogen, phosphorus, and potassium for the plant production system.
  - (6) Realistic yield goals and a description of how they were determined.
  - (7) Quantification of all important nutrient sources (this could include but not be limited to commercial fertilizer, animal manure and other organic by-products, irrigation water, etc.).
  - (8) Planned rates, methods, and timing (month & year) of nutrient application.

(9) Location of designated sensitive areas or resources (if present on the conservation management unit).

(10) Guidance for implementation, operation, maintenance, and recordkeeping.

D. When applicable, plans for nutrient management should include other practices or management activities as determined by specific regulation, program requirements, or producer goals.

E. States are encouraged to adopt protocol for the format and appearance of nutrient management plans that is in accordance with the National Planning Procedures Handbook (NPPH) and other state developed guidance.

F. If the Conservation Management Unit lies within a hydrologic unit area that has been identified or designated as having impaired water quality associated with nitrogen or phosphorus, plans for nutrient management include an assessment of the potential for nitrogen or phosphorus transport from the field. The Leaching Index (LI) and/or Phosphorus Index (PI), or other assessment tools accepted by NRCS, may be used to make these assessments.

(1) When such assessments are made, nutrient management plans will include:

(i) A record of the site rating for each field.

(ii) Information about conservation practices and management actions that can reduce the potential for phosphorus movement from the field.

(2) The results of such assessments and recommendations are discussed with the producer as a normal part of the planning process.

G. Review And Revision Of Nutrient Management Plans

(1) Plans for nutrient management should be reviewed periodically to determine if adjustments or modifications are needed. Annual reviews are highly recommended. The results of such reviews should be documented in the plan, as well as the identification of the person who made the review.

(i) States are encouraged to develop procedures for periodic reviews so that they may be completed by the producer or the representative of the producer.

(ii) When a review indicates that a revision of the plan is needed, the revised plan is approved by a certified nutrient management specialist.

(2) A thorough review of plans for nutrient management plans is done on a regular cycle not to exceed five years. This review should coincide with the soil test cycle.

## **402.5 Soil and Plant Tissue Testing**

A. Current soil test information is used in the development of all plans for nutrient management. As a minimum, tests should include information for pH, phosphorus, and potassium. Tests for other elements may be required when needed to develop plans for nutrient management or to comply with state or local requirements.

(1) Current soil tests are those no older than five (5) years, or

(2) Are less than five (5) years old if required by the state.

B. Soil Sampling

- (1) Soil samples are taken and handled in accordance with Land Grant University guidance or standard industry practice if accepted by the Land Grant University within the state.
- (2) In situations where there are special production or environmental considerations, the use of other sampling techniques is encouraged. For example:
  - (i) Sub-soil sampling for residual nitrate in irrigated crop production systems.
  - (ii) Pre-sidedress Nitrogen Test and/or Pre Plant Soil Nitrate test.
  - (iii) Sampling of the surface layer (0-2 inches) for elevated soil phosphorus or soil acidity when there is permanent vegetation, non-inversion tillage, or when animal manure or other organic by-products are broadcast or surface applied and not incorporated.
- (3) Soil test analysis is performed by laboratories that are accepted in one or more of the following programs:
  - (i) State Certified Programs.
  - (ii) The North American Proficiency Testing Program (Soil Science Society of America).
  - (iii) Laboratories participating in other programs whose tests are accepted by the Land Grant University in the state in which the tests are used as the basis for nutrient application.
- (4) The use of tissue analysis and other such tests should be recommended when needed to ensure acceptable nutrient management.
- (5) The nutrient content of animal manure and other organic by-products is based on:
  - (i) Laboratory analysis of the material.
  - (ii) Accepted book values recognized by NRCS in the absence of laboratory analysis.
  - (iii) Historic records for the operation if they exist and give an accurate estimate of the nutrient content of the manure.

#### **402.6 Nutrient Application Rates**

- A. Soil amendments are recommended, as needed, to adjust and maintain soil pH at the specific range of the crop for optimum availability and utilization of nutrients.
- B. Recommended nutrient application rates are based upon Land Grant University guidance or standard industry practice if recognized by the Land Grant University. Current soil test results, realistic yield goals, producer management capabilities, and other pertinent information are considered when determining recommended nutrient application rates.
- C. The planned and actual rates of nutrient application shall not normally exceed recommended rates when commercial fertilizer is the only source of nutrients being applied. When site specific conditions require that either planned or actual rates of application differ from or exceed recommended rates, the records for the plan shall document the reason.
- D. Producers shall be advised that the planned rates of nutrient application (nitrogen, phosphorus, and potassium) may exceed recommended rates when custom blended commercial fertilizers are not available, or when animal manures or other organic by-

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products are used as a nutrient source. When custom blended commercial fertilizers are not available, the planned rates of application shall match recommended rates as closely as possible. When animal manure or other organic by-products are applied, the following guidance shall be used for determining planned application rates:

- (1) Nitrogen Application. Manure may be applied to legume crops at a rate equal to the estimated nitrogen removal in harvested plant biomass.
- (2) Phosphorus application will be in accordance with one of the following options.
  - (i) Phosphorus Index (PI): When the PI is used, phosphorus may be applied at rates consistent with Table 1.

Table 1 *	
Phosphorus Index Rating	Phosphorus Application
Low Risk	Nitrogen Based
Medium Risk	Nitrogen Based
High Risk	Phosphorus Based (e.g. crop removal)
Very High Risk	Phosphorus Based (e.g. no application)
* See 402-06(d)(2)(v)	

- (ii) Phosphorus Threshold: When soil specific Phosphorus Threshold (TH) values are available, phosphorus may be applied at rates consistent with Table 2.

Table 2 *	
< 3/4 TH	Nitrogen Based
=> 3/4 TH, < 1 1/2 TH	Phosphorus Based (e.g. crop removal)
=> 1 1/2 TH, < 2 TH	Phosphorus Based (e.g. 1/2 crop removal)
=> 2 TH	Phosphorus Based (e.g. no application)
* See 402-06(d)(2)(v)	

- (iii) Soil Test Phosphorus: When soil test phosphorus levels are used, phosphorus may be applied at rates consistent with Table 3 or Figure 1.

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Table 3 *	
Low	Nitrogen Based
Medium	Nitrogen Based
High	Phosphorus Based (e.g. 1.5 times crop removal)
Very High	Phosphorus Based (e.g. crop removal)
Excessive	Phosphorus Based (e.g. no application)
* See 402-06(e)(2)(v)	

[Click here for Figure 1\\*\\*](#)

(iv) State developed guidance for using Tables 1, 2, and 3 and Figure 1 will be used to establish criteria for a Resource Management System (RMS) level of nutrient management. State developed guidance will include input from the State Technical Committee and be coordinated across state lines to ensure compatibility and consistency with guidance developed in adjoining states.

(v) When using Tables 1, 2, or 3, states determine acceptable phosphorus based application rates as a function of estimated phosphorus removal in harvested plant biomass. Rates of application should decrease as soil phosphorus levels or the risk of transport increase. Guidance may include recommendations for no application. The application rates shown in the tables are provided as guidance. Both the State Technical Committee and Land Grant University should be involved in developing these rates.

(vi) When using Figure 1, states determine soil phosphorus levels at which nitrogen based manure application is acceptable and when phosphorus based manure application is recommended. Phosphorus based manure application rates shall be developed as a function of estimated phosphorus removal in harvested plant biomass. Phosphorus application rates should decrease as available soil phosphorus levels increase. Guidance may include a recommendation of no application. Both the State Technical Committee and Land Grant University should be involved in developing this guidance.

(vii) Accommodation may be made for a single application of phosphorus applied as manure at a rate equal to the recommended phosphorus application rate or estimated phosphorus removal in harvested plant biomass for the crop rotation or multiple years in the crop sequence. Multi-year phosphorus applications will not be at rates which exceed the annual nitrogen recommendation of the year of application or on sites considered vulnerable to off-site transport of phosphorus unless the appropriate conservation practices, best management practices, or management activities are used to reduce vulnerability.

(3) Potassium Application

- (i) Excess potassium will not be recommended in situations in which it causes unacceptable nutrient imbalances in crops or forages.
- (ii) When forage quality and animal health are issues associated with excess potassium application, state standards will be used to set forage quality guidelines.

E. Other plant nutrients should be applied as needed.

F. Starter fertilizers containing nitrogen, phosphorus, and potassium may be recommended in accordance with Land Grant University guidance or industry practice if recognized by the Land Grant University within the state.

## 402.7 Special Considerations

A. Plans developed for nutrient management that include the use of manure or other organic by-products will:

- (1) Identify the size of the land base needed to enable plan implementation based on phosphorus, even when initial implementation will be based on nitrogen, unless other provisions that do not involve land application are made for utilizing the manure.
- (2) Document the soil phosphorus level at which plan implementation on a phosphorus standard would be desirable.
- (3) Include a field-by-field assessment of the potential risk for phosphorus transport from the field. This assessment may be made using the Phosphorus Index (PI) or other assessment tool recognized and accepted by NRCS.
  - (i) When a phosphorus assessment is completed, the plans will describe:
    - A record of the ratings for each field.
    - Information about conservation practices and management activities that can reduce the potential for phosphorus transport from the field.
  - (ii) The results of a phosphorus assessment and recommendations will be discussed with the producer as a normal part of the planning process.
- (4) Recognize that some manures contain heavy metals and should be accounted for in the plan for nutrient management.

B. Progressive Planning

- (1) The National Planning Procedures Handbook, Part 600.1, provides guidance for progressive planning designed to assist producers who cannot initially plan for a Resource Management System (RMS).
- (2) The progressive planning process may be used to help existing producers achieve an RMS level system when an RMS cannot be immediately implemented. Such plans shall include:
  - (i) A description of the RMS level system which the producer will be working to achieve.
  - (ii) Conservation practices, management activities, and milestones (installation schedules) that demonstrate movement toward an RMS.
- (3) Annual review of nutrient management systems being implemented through the progressive planning process is highly encouraged to determine progress.

- C. When plans for nutrient management are developed and implemented in a way that results in expected increases in soil phosphorus levels, the plans will include:
- (1) Discussion about the potential for phosphorus accumulation in the soil and how such accumulation increases the potential for transport, animal health, or crop production problems.
  - (2) Discussion of the potential for soil phosphorus draw-down from the production and harvesting of crops.
- D. In areas with specially protected water bodies, plans will be developed incorporating any special requirements that are applicable within these areas.
- E. Land application of sewage sludge
- (1) When sewage sludge is applied to agricultural land, the accumulations of potential pollutants from such sources (including: Arsenic, Cadmium, Copper, Lead, Mercury, Selenium, and Zinc) in the soil is monitored in accordance with the US Code Reference 40 CFR Parts 403 and 503, applicable state laws, and/or local ordinances. States may determine if such provisions should also be required for the land application of animal manure and other organic by-products that contain any of these metals.
  - (2) Sewage sludge is analyzed prior to land application to determine its nutrient value, heavy metals, and salt content.
  - (3) Acceptable application rates of sewage sludge are determined using guidelines in this policy, and applicable Federal, state, or local regulations.
- F. Producers will be reminded that when producing "fresh, edible crops for the produce market, such as vegetables, root, or tuber crops" and using sewage sludge, animal manure, or other organic materials as a source of nutrients, applications should be in accordance with provisions of all applicable Federal, state, or local laws or policies.

## 402.8 Record Keeping

- A. It is the responsibility of producers, or the agents of producers, to maintain records which document the implementation of plans for nutrient management. Records include:
- (1) Soil test results and recommended nutrient application rates.
  - (2) Quantities and sources of nutrients applied; and heavy metals if applicable.
  - (3) Dates (month and year) on which nutrients were applied.
  - (4) Methods by which nutrients were applied (e.g. broadcast, incorporated after broadcast, injected, or fertigation).
  - (5) Crops planted and dates of planting.
  - (6) Harvest dates and yields of crops.
  - (7) Where applicable, results of water quality tests (including irrigation water), plant tissue, or other organic by-products tests.
  - (8) The results of reviews including the identification of the person completing the review and any recommendations that resulted from the review.
- B. Records which document implementation of the plan should be retained for a period of five years; or for a period longer than five years if specified by other Federal or state agencies or local ordinances, or program or contract requirements.



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C. National Instruction No. 120-310, Amendment No. 4, dated June 17, 1998, provides guidance for responding to requests for access to these records.