USDA
NATURAL RESOURCES
CONSERVATION SERVICE

MARYLAND CONSERVATION
PRACTICE STANDARD

NUTRIENT MANAGEMENT

CODE 590
(Reported by Acre)

DEFINITION

Managing the amount, source, placement, form, and timing of the application of plant nutrients and soil amendments.

PURPOSES

This practice may be applied for one or more of the following purposes:

1. To budget and supply nutrients for plant production;

2. To properly utilize manure and organic by-products or biosolids as a plant nutrient source;

3. To minimize agricultural non-point source pollution of surface and ground water resources;

4. To protect air quality by reducing nitrogen emissions (ammonia and NOx compounds) and the formation of atmospheric particulates;

5. To maintain or improve the physical, chemical, and biological condition of soil.

CONDITIONS WHERE PRACTICE APPLIES

This practice applies to all lands where plant nutrients and soil amendments are applied.

CONSIDERATIONS

Nutrient management planning relies heavily upon regular soil and manure testing, using proper sampling techniques and analytical methods, realistic expected yield goals, consideration of the effects of cover crops and/or crop rotations on nutrient cycling and availability for plant uptake, and the timing and placement of plant nutrients.

The use of management activities and technologies listed in this section may improve both production and the environmental performance of nutrient management systems.

The nutrient management plan should be reviewed annually to determine if any changes are needed for the next planned crop.

Consider the following when developing a nutrient management plan:

1. The effects of the seasonal water budget on nutrient balance and on potential nutrient losses from the plant environment to surface or ground water or to the atmosphere;

2. The use of cover crops following crop harvest, where appropriate, to utilize and recycle residual nutrients and control soil erosion. Timely planting of cover crops is essential if they are to be effective;

3. The importance of soil tilth and organic matter content on plant nutrient absorption, root development, and water infiltration;

4. The use of practices such as crop rotations, selection of crop varieties, waste utilization, etc., which will enhance efficiency of nutrient uptake and improve soil and soil water resource conditions;

5. The effects of water table management or controlled drainage on availability and movement of nutrients;

6. Recent test results, preferably less than one year old, of soil, plant, manure, and wastewater used for irrigation when developing new nutrient management plans, particularly if animal manures or organic amendments are used as a nutrient source, if any crop/farming practices have been significantly altered, or

Conservation practice standards are reviewed periodically, and updated if needed. To obtain the current version of this standard, contact the Natural Resources Conservation Service - Maryland or visit the electronic Field Office Technical Guide (eFOTG).

increases in soil phosphorus levels are expected;

7. For sites on which there are special environmental concerns, using other sampling techniques, such as soil profile sampling for nitrogen, Pre-Sidedress Nitrogen Test (PSNT), Pre-Plant Soil Nitrate Test (PPSN), Cornstalk Nitrogen Test (CSNT) or soil surface sampling for phosphorus accumulation or pH changes;

8. To manage the conversion of nitrogen in liquid manure or fertilizer, using products or materials that more closely match nutrient release and availability for plant uptake (e.g., nitrification inhibitors, urease inhibitors and slow or controlled release fertilizers). These materials may improve the nitrogen use efficiency (NUE) of the nutrient management system by reducing losses of nitrogen into water and/or air;

9. The use of additional conservation practices that can reduce the transport and leaching of dissolved and attached nutrients, improve soil nutrient and water storage, improve aeration and soil tilth, and protect or improve water quality;

10. Limitations of the equipment when recommending application rates. For information on equipment for manure application, refer to the Maryland Nutrient Management Manual, Section III-A, Animal Manure and Waste Management;

11. Waste management system planning, storage, and treatment needs to ensure efficient timings of waste application to crops as well as land area requirements for proper waste utilization.

12. Minimizing the impact of odors of land-applied animal manure or organic amendments by applying when temperatures are cool and when wind direction is away from neighbors. Consider injection or incorporation of manure or other organic by-products as a means to minimize odors;

13. Additional practices to enhance the producer's ability to manage manure effectively, such as modification of the animal's diet to reduce the manure nutrient content, or utilizing manure amendments that stabilize or tie-up nutrients;

14. Alternative uses to land application of manure or organic by-products, including the redistribution of these materials to nutrient deficit areas and the production of value-added products, such as pelletized fertilizers and compost;

15. The environmental effects of pathogens and other disease causing organisms in nutrient sources;

16. The use of planned grazing systems to reduce the need for storing, hauling and spreading manure.

CRITERIA

Criteria Applicable to All Purposes

Plans for nutrient management shall comply with all applicable federal, state, and local laws and regulations.

Plans for nutrient management shall be developed in accordance with policy requirements of the NRCS General Manual Title 450, Part 401.03 (Technical Guides, Policy and Responsibilities) and Title 190, Part 402 (Ecological Sciences, Nutrient Management, Policy); technical requirements of the NRCS Field Office Technical Guide (FOTG); procedures contained in the National Planning Procedures Handbook (NPPH), the NRCS National Agronomy Manual (NAM) Section 503 and the Maryland Nutrient Management Manual (COMAR 15.20.07.04-08).

Persons who develop, review or approve plans for nutrient management shall be certified through the Maryland Department of Agriculture – Nutrient Management Certification Program (including reciprocity agreements) or a certification program acceptable to NRCS Maryland. (Refer to the Maryland Nutrient Management Regulations, COMAR 15.20.04 - Nutrient Management Certification and Licensing.)

Plans for nutrient management that are elements of a more comprehensive conservation plan shall recognize other requirements of the conservation plan and be compatible with its other requirements.

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A crop nutrient budget for nitrogen, phosphorus, and potassium shall be developed that considers all potential sources of nutrients including, but not limited to animal manure and organic by-products, wastewater, commercial fertilizer, crop residues, legume credits, and irrigation water.

Maryland Nutrient Management regulations require crop yield goals to be based on the average of the best 3 yields in the past 5 years or, in the absence of yield data, soil productivity charts in the NRCS Field Office Technical Guide (FOTG). Realistic yield goals shall be established based on soil productivity information, historical yield data, climatic conditions, level of management and/or local research on similar soil, cropping systems, and soil, plant, and manure/organic by-products tests. For new crops or varieties, industry estimates of realistic yield goals may be used until documented yield information is available. (Refer to the Maryland Nutrient Management Regulations, COMAR 15.20.08 - Content and Criteria for Nutrient Management Plan Developed for an Agricultural Operation.)

Areas contained within established minimum application setbacks (e.g., sinkholes, wells, gullies, ditches, surface inlets or rapidly permeable soil areas) shall not receive direct applications of nutrients.

Nutrient management plans shall specify the form, source, amount, timing, method of application, and incorporation, if applicable, of nutrients on each field to achieve realistic yield goals, while minimizing the movement of nutrients and other potential contaminants to surface and /or ground waters, and the degradation of soil and air quality.

The following methods and timing shall be used as appropriate to reduce the risk of nutrients being transported to ground and surface waters, or into the atmosphere:

1. Using a Pre-Sidedress Nitrogen Test (PSNT) to determine additional nitrogen application rates, especially when manure was applied as a fertilizer source prior to planting;

2. Split applications of nitrogen when applicable to provide nutrients at the times of maximum crop utilization;

3. Banding applications of inorganic phosphorus when row cropping;

4. Timely incorporation of land applied manures or organic by-products.

Conservation practices to address nutrients lost to soil erosion, runoff, irrigation, and drainage that impacts water quality shall be planned and installed on fields that receive nutrients.

Nutrient planning shall be based on current soil and tissue (where used as a supplement) test results developed in accordance with University of Maryland Cooperative Extension guidance and recommendations. Current soil tests are those that are no older than three years. (Refer to the Maryland Nutrient Management Manual.)

Soil and Tissue Sampling and Laboratory Analyses (Testing) - Nutrient planning shall be based on current soil and tissue (where used as a supplement) test results developed in accordance with University of Maryland Cooperative Extension guidance and recommendations. Current soil tests are those that are no older than three years. (Refer to the Maryland Nutrient Management Manual.)

Soil testing shall include, as a minimum, analysis for organic matter, pH, lime requirement, plant available phosphorus, and potassium. Also, soil testing shall include analysis for any other nutrients for which specific information is needed to develop the nutrient management plan.

Plant tissue sampling and testing, where used, shall be conducted in conjunction with a current soil test.

Soil and tissue samples shall be collected and prepared according to the University of Maryland Cooperative Extension guidance and recommendations (refer to the Maryland Nutrient Management Manual) or standard industry practice. Soil and tissue test analyses shall be performed by laboratories whose soil test results are directly convertible to the University of Maryland Cooperative Extension's Fertility Index Value (FIV) scale. Tables for converting soil test results from other laboratories to equivalent University of Maryland FIVs are available from the University of Maryland Cooperative Extension.

Field Risk Assessment - Phosphorus Site Index (PSI) Rating - The Phosphorus Site Index assessment rating for a field is based on phosphorus loss potential due to site and transport characteristics (Part A) and phosphorus loss potential due

to management practices and P source characteristics (Part B). Details on the proper method to conduct a PSI assessment are available from the University of Maryland Cooperative Extension and NRCS.

When the soil test phosphorus fertility index value (FIV) reaches the Maryland regulated threshold (currently set at equal or greater than FIV of 150), the Phosphorus Site Index (PSI), a field-specific assessment of the potential for phosphorus transport from the field, shall be used if Phosphorus is to be applied. (Refer to the Maryland Nutrient Management Manual.) When the soil test based FIV threshold (FIV $\geq$150) has been reached, nutrient management plans shall include:

1. A record of the assessment rating for each field or management unit, and

2. Information about conservation practices and management activities that can reduce the potential for phosphorus movement from the site.

When the PSI assessment is completed, the results of the assessment and recommendations shall be discussed with the producer during the development of the nutrient management plan.

Nutrient Application Rates - Recommended nutrient application rates shall be based on University of Maryland recommendations that consider current soil test results, soil productivity class, expected realistic yield goals, climate, and management capabilities. Refer to the Maryland Nutrient Management Manual for crop specific nutrient recommendations.

The planned rates of nutrient application, as documented in the nutrient management plan, shall be determined based on the following guidance:

1. Nitrogen application. Planned Nitrogen application rates shall match the recommended rates as closely as possible, except when manure or organic by-products are a source of nutrients. When manure or organic by-products are a source of nutrients, see "Additional Criteria."

2. Phosphorus application. Planned phosphorus application rates shall match the recommended rates as closely as possible, except when manure or organic by-products are sources of nutrients. Phosphorus application rates should be based on the results of a soil test and/or P Site Index assessment of the field or management unit.

   When manure or organic by-products are a source of nutrients, see "Additional Criteria."

3. Potassium application. Potassium shall not be applied in situations in which excess (greater than soil test potassium recommendation) causes unacceptable nutrient imbalances in crops or forages. Rates shall not exceed the recommended rates established by the Maryland Nutrient Management Manual and written in the nutrient management plan for each field or management unit.

   When forage quality is an issue associated with excess potassium application, state standards shall be used to set forage quality guidelines.

4. Irrigated nutrients. When irrigation is used, the nitrogen content of the irrigation water shall be determined and considered in the overall crop nutrient budget and included in the nutrient management plan. The application rate (in/hr) for material applied through irrigation shall not exceed the soil intake/infiltration rate. The total application shall not exceed the field capacity of the soil.

5. Liming material. Soil amendments shall be applied, as needed, to adjust soil pH to the specific range of the crop for optimum availability and utilization of nutrients. Such applications shall be in accordance with the University of Maryland guidelines and recommendations. If the liming material also provides plant nutrients (e.g., as with lime-stabilized biosolids), especially N and P, the application rates of these nutrients must be considered in the nutrient management plan.

6. Other plant nutrients. The planned rates of application for other nutrients shall be consistent with University of Maryland guidelines and recommendations.

7. Starter fertilizers. Starter fertilizers may be applied in accordance with University of Maryland guidelines and recommendations. When starter fertilizers are used, they shall be included in the overall crop nutrient budget

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and applied in accordance with University of Maryland guidelines and recommendations.

Nutrient Application Timing - Timing and method of nutrient application (particularly nitrogen) shall correspond as closely as possible with plant nutrient uptake characteristics, while considering cropping system limitations, weather and climatic conditions, risk assessment tools (e.g., Phosphorus Site Index) and field accessibility.

Nutrient Application Methods - Application methods to reduce the risk of nutrient transport to surface and ground water, or into the atmosphere shall be employed.

To minimize nutrient losses:

1. Apply nutrient materials uniformly to application area(s);

2. Nutrients shall not be applied to frozen, snow-covered or saturated soil if the potential risk for runoff exists;

3. Nutrients shall be applied considering the plant growth habits, irrigation practices, and other conditions so as to maximize availability to the plant and minimize the risk of runoff, leaching, and volatilization losses;

4. Nutrient applications associated with irrigation systems shall be applied in a manner that prevents or minimizes resource impairment.

Conservation Management Unit (CMU) Risk Assessment – A CMU is defined as a field, fields, or other land units of the same land use having similar treatment needs and planned management. In areas with identified or designated nutrient-related water quality impairment, a specific risk assessment of the potential for nutrient transport from the area shall be completed for the CMU.

States that utilize a threshold prescreening procedure to trigger CMU risk assessment shall follow approved procedures as recommended by the respective state or University of Maryland Cooperative Extension.

Use an appropriate nutrient risk assessment tool for the nutrient in question (e.g., phosphorus site index for phosphorus or PSNT when side-dressing nitrogen) or other state-recognized assessment tool.

Additional Criteria Applicable to Manure and Organic By-Products or Biosolids Applied as a Plant Nutrient Source

When animal manures or organic by-products are applied, a risk assessment of the potential for nutrient transport from the CMU shall be completed to adjust the amount, placement, form and timing of application of nutrient sources, as recommended by the State of Maryland or University of Maryland Cooperative Extension.

Manure/Organic Amendment Testing - Nutrient values of manure and organic amendments (excluding sewage sludge or biosolids) shall be determined prior to land application based on laboratory analyses and appropriate plant availability factors. Samples will be taken and analyzed with each hauling/emptying cycle for a storage/treatment facility. Manure sampling frequency may vary based on the operation's manure handling strategy and spreading schedule. If there is no prior sampling history the manure shall be analyzed at least annually for a minimum of three consecutive years. A cumulative record shall be developed and maintained until a consistent level of nutrient values is realized. The average of results contained in the operation's cumulative manure analyses history shall be used as a basis for nutrient allocation to fields. Samples should be prepared in accordance with recommendations of the University of Maryland Cooperative Extension, and as close to the application date as feasible. Adequate time should be allowed for the analyses, clean-out, spreader calibration, and field application.

Analyses will be performed through a testing laboratory whose techniques are consistent with those recommended by the University of Maryland.

In planning for new operations, acceptable "book values" recognized by the NRCS and/or University of Maryland may be used for planning purposes. In the first year, an actual sample shall be obtained and analyzed, and the plan revised to reflect the test results. Book values recognized by NRCS may be found in the Agricultural Waste Management Field Handbook, Chapter 4 – Agricultural Waste Characteristics and/or Chapter 11 Waste Utilization; Nutrient Management (g) Rule-of-thumb estimates.

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Calculating Manure Production **-** To calculate the amount of manure available for crop utilization from different animal types and production systems, use the information Excel worksheets provided by the University of Maryland located at: www.agnr.umd.edu/users/agron/nutrient.

Manure & Organic By-Product Applications - The planned rates of manure and organic by-product nutrient application rates shall be based on nutrient analysis procedures recommended by the University of Maryland Cooperative Extension. As indicated above, "book values" may be used in planning for new operations. At a minimum, manure analyses shall identify nutrient and specific ion concentrations, percent moisture, and percent organic matter. Salt concentration shall be monitored so that manure applications do not cause plant damage or negatively impact soil quality.

The application rate (in/hr) of liquid materials applied shall not exceed the soil intake/infiltration rate and shall be adjusted to minimize ponding and avoid runoff. The total application shall not exceed the field capacity of the soil and shall be adjusted, as needed, to minimize loss to subsurface tile drains.

The planned rates for nitrogen and phosphorus application shall be determined based on the following:

1. Nitrogen application rates.

   a. When manure or organic by-products are used, the nitrogen availability of the planned application rates shall match plant uptake characteristics as closely as possible, tanking into consideration the timing of nutrient applications(s) in order to minimize leaching and atmospheric losses;

   b. Management activities and technologies shall be used that effectively utilize mineralized nitrogen and that minimize nitrogen losses through denitrification and ammonia volatilization;

   c. Manure or organic by-products may be applied on legumes at rates equal to the estimated removal of nitrogen in harvested plant biomass;

   d. When the nutrient management plan component is being implemented on a phosphorus basis, manure or organic by-products shall be applied at rates consistent with a phosphorus limited the nutrient management plan component is being implemented on a phosphorus basis, manure or organic by-products shall be applied at rates consistent with a phosphorus limited application rate. In such situations additional nitrogen application, from non-organic sources, may be required to supply, but not exceed, the recommended amounts of nitrogen in any given year.

2. Phosphorus application rates.

   When manure or organic by-products are used, the planned rates of phosphorus application shall be consistent with any one of the following options:

   a. Soil test - Nitrogen-based manure application on sites for which the soil test recommendations calls for phosphorus application; phosphorus-based or no manure application on sites for which the soil test recommendation calls for no phosphorus application;

   b. Phosphorus Site Index Rating (PSI) - Nitrogen-based manure application on Low Risk Sites; Nitrogen-based manure application 1 out of three years on Medium Risk Sites; phosphorus-based or soil-test based P application on High Risk Sites and no phosphorus application on Very High Risk Sites.

Phosphorus Site Index (PSI) Rating - The following PSI ratings are used in Maryland to determine appropriate P application rates for manure and other organic amendments:

1. Phosphorus Site Index < 50. Low potential for P movement from this site given current management practices and site characteristics. Nitrogen-based nutrient management planning is satisfactory for this site. Soil P levels and P loss potential may increase in the future due to continued nitrogen-based nutrient management;

2. Phosphorus Site Index 51 – 75. Medium potential for P movement from the site given

current management practices and site characteristics. Practices should be implemented to reduce P losses. Nitrogen-based nutrient management should be implemented no more than one year out of three. Phosphorus-based nutrient management should be implemented two years out of three during which time P applications should be limited to the amount expected to be removed from the field by crop harvest or soil test P based application recommendations, whichever is greater;

3. Phosphorus Site Index = 76 – 100. High potential for P movement from the site given current management practices and site characteristics. Phosphorus-based nutrient management planning should be used for this site. Phosphorus applications should be limited to the amount expected to be removed from the field by crop harvest or soil test P based application recommendations. All practical management practices for reducing P losses by surface runoff, subsurface flow, or erosion should be implemented;

4. Phosphorus Site Index > 100. Very high potential for P movement from the site given current management practices and site characteristics. No phosphorus should be applied to this site. Active remediation techniques should be implemented to reduce the P loss potential from the site.

Note: The use of certain conservation practices can reduce the risk of phosphorus movement, thereby lowering the risk level from a higher category to a lower category.

The application of phosphorus applied as manure may be made at a rate equal to the recommended phosphorus application or estimated phosphorus removal in harvested plan biomass for the crop rotation and/or three years maximum crop sequence. When such applications are made, the application rate shall:

1. Not be made on sites considered vulnerable to off-site phosphorus transport unless appropriate conservation practices or management activities are used to reduce the vulnerability; and,

2. Not exceed the recommended nitrogen application rate during the year of application; or,

3. Not exceed the estimated nitrogen removal in harvested plan biomass during the year of application when there is no recommended nitrogen application.

Biosolids (Sewage Sludge). Where non-farm organic waste (e.g., municipal sewage sludge) is to be utilized, recommended application rates will be determined by using current University of Maryland recommendations and the 590 nutrient management standard and specifications.

These materials must also be applied to meet federal, state or local regulations. Appropriate documentation of amounts applied must be maintained by the applicator according to state regulations. The Maryland Department of the Environment currently regulates the land treatment of sewage sludge.

When sewage sludge is applied, the accumulation of potential pollutants, including arsenic, cadmium, copper, lead, mercury, selenium, and zinc, in the soil shall be monitored in accordance with USEPA regulations, the US Code, Reference 40 CFR, Parts 403 and 503, and/or any applicable state and local laws and regulations.

To be consistent with the Maryland Nutrient Management Law, P applications cannot exceed the amount of P removed in the harvested portion of the crops grown for the next three years. When P is applied at the "three-year crop removal rate," no additional P can be applied in the following two years. All practical management practices for reducing P losses shall be implemented.

Additional Criteria to Minimize Agricultural Non-point Source Pollution of Surface and Ground Water Resources

Plans developed to minimize agricultural non-point source pollution of surface or ground water resources shall include practices and/or management activities that can reduce the risk of phosphorus movement from the field.

In areas with an identified or designated nutrient-related water quality impairment, the Phosphorus Site Index shall be completed even if manure/organics are not being used. The results of this assessment shall be discussed with the producer and appropriate recommendations shall be included in the nutrient management plan.

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Additional Criteria to Improve the Physical, Chemical, and Biological Condition of the Soil

Nutrients shall be applied in such a manner as not to degrade the soil's structure, chemical properties, or biological conditions. Use of nutrient sources with high salt content will be minimized unless provisions are used to leach salts below the crop root zone.

Nutrients shall not be applied to flooded or saturated soils when the potential for soil compaction and the creation of ruts is high.

PLANS AND SPECIFICATIONS

Plans and specifications for this practice shall be prepared in accordance with the previously listed criteria. Plans and specifications shall contain sufficient detail to ensure successful implementation of this practice. Documentation shall be in accordance with the section "Supporting Data and Documentation" in this standard.

Nutrient management plans shall include a statement that the plan was developed based on requirements of the current standard and any applicable Federal, state, or local regulations, policies, or programs, which may include the implementation of other practices and/or management activities. Changes in any of these requirements may necessitate a revision of the plan.

The following components shall be included in the nutrient management plan:

1. Aerial site photograph(s) or site map(s), and a soil survey map of the site;
2. Location of designated sensitive areas or resources and the associated, nutrient management restriction;
3. Current and/or planned plant production sequence or crop rotation;
4. Results of soil, water, manure and/or organic by-product sample analyses;
5. Results of plant tissue analyses, when used for nutrient management;
6. Realistic yield goals for the crops;
7. Complete nutrient budget for nitrogen, phosphorus, and potassium for the crop rotation or sequence;
8. Listing and quantification of all nutrient sources;
9. CMU-specific recommended nutrient application rates, timing, form, and method of application and incorporation; and,
10. Guidance for implementation, operation, maintenance, and recordkeeping.

Where applicable, the following components shall also be included in the nutrient management plan:

1. Type, number, and average size of animals;
2. Quantities of manure generated annually, total amount of manure used on the farm each year, including any imported manure, and amount and destination of all manure exported;
3. Record of the phosphorus and/or nitrogen assessment rating for each management unit including documentation for each;
4. Conservation practices and management activities needed to reduce the potential for nutrient movement from the site;
5. Crop production and nutrient management techniques needed to reduce soil phosphorus levels from "excessive" or "very high" into "optimum" ranges for crop growth;
6. Other practices or management activities, as determined by specific regulation, program requirements, or producer goals.

If increases in soil phosphorus levels are expected, the nutrient management plan shall document:

1. The soil phosphorus levels at which it may be desirable to convert to phosphorus based planning;
2. Results of appropriate risk assessment tools to document the relationship between soil phosphorus levels and potential for phosphorus transport from the field;
3. The potential for soil phosphorus drawdown from the production and harvesting of crops; and,

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4. Management activities or techniques used to reduce the potential for phosphorus loss.

OPERATION AND MAINTENANCE

The producer/client is responsible for the operation and maintenance of this practice. Operation and maintenance activities addresses the following:

1. Periodic plan review to determine if adjustments or modifications to the plan are needed. As a minimum, plans will be reviewed and revised every 3 years. More frequent reviews may be warranted and are encouraged if changes in the nutrient management plan are desirable or needed for the next planned crop;

2. Protection of fertilizer and organic by-product storage facilities from weather and accidental leakage or spillage;

3. Maintenance and calibration of application equipment to ensure uniform distribution of material at planned rates.

Workers shall be protected from and avoid unnecessary contact with chemical fertilizers and organic by-products. Protection shall include the use of protective clothing when working with plant nutrients. Extra caution must be taken when handling ammonia sources of nutrients, or when dealing with organic wastes stored in unventilated enclosures.

Rinsate material generated by the cleaning of nutrient application equipment shall be handled properly. Excess material shall be collected and stored or field applied in an appropriate manner. Excess material shall not be applied on areas of high potential risk for runoff or leaching.

The proper disposal or recycling of nutrient containers shall be done according to state and local guidelines or regulations.

Record Keeping

Producers must maintain records to document plan implementation. Records shall be maintained for a minimum of five years; or for a period longer than five years if required by other federal, state, or local ordinances, or program or contract requirements. As applicable, records include:

1. A copy of the nutrient management plan;

2. Soil test results and recommendations for nutrient application;

3. Quantities, analyses, and sources of nutrients applied;

4. Documentation of the actual rate at which nutrients were applied. When the actual rates used differ from or exceed the recommended and planned rates, records will indicate the reasons for the differences;

5. Dates (month and year) and method of nutrient applications, including type of incorporation, if applicable;

6. Crops planted, harvest dates, yields, and crop residues removed;

7. Results of applicable water, plant, and/or organic by-product analyses;

8. Amount and type of manure exported from the farm and the name, address, and organization responsible for utilizing exported manure.

9. Dates of review, person performing the review and recommendations that resulted from the review.

SUPPORTING DATA AND DOCUMENTATION

The following is a list of the minimum data and documentation to be recorded in the case file:

1. Aerial photograph and soil map;

2. Document the following in the assistance notes:

   a. Document that the producer verified the nutrient management plan was developed by a Maryland certified nutrient management consultant and is current according to State Law;

   b. Document that the producer verified he/she is implementing the nutrient management plan according to State Law;

   c. As appropriate, the notes shall also include dates of any site visits, name or ini-

tials of the person who made the visit, and specifics as to nutrient management plan adjustments or modifications made by the certified nutrient management specialist (if NRCS is providing this service).

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