

**NATURAL RESOURCES CONSERVATION SERVICE  
CONSERVATION PRACTICE STANDARD**

**NUTRIENT MANAGEMENT**

(Acre)

**CODE 590**

**DEFINITION**

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

**PURPOSES**

It is intended that nutrient management plans, developed from this standard, be used to help producers improve or maintain their level of management and expertise as it relates to the application of nutrients on the lands they own and/or control.

- To budget and supply adequate nutrients for plant production.
- To properly utilize manure or organic by-products as a plant nutrient source.
- To minimize or prevent agricultural nonpoint source pollution of surface and ground water resources.
- To protect air quality by reducing nitrogen emissions (ammonia and NO<sub>x</sub> compounds) and the formation of atmospheric particulates.
- 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. Soil amendments include composted animal waste.

Animal waste deposited by grazing animals on

pasture or rangeland where there are no additional nutrients applied as commercial fertilizer or soil amendments is not considered land application.

**CRITERIA**

**General Criteria Applicable to All Purposes**

A Nutrient Management Plan (NMP) for nitrogen (N), phosphorus (P) and potassium (K) shall be developed when nutrients are applied.

NMPs shall be developed in accordance with policy requirements of the Natural Resources Conservation Service (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 Idaho NRCS Field Office Technical Guide (FOTG); procedures contained in the National Planning Procedures Handbook (NPPH) and the NRCS National Agronomy Manual (NAM), Section 503.

Persons who approve plans for nutrient management shall be certified through the joint certification program of the Idaho State Department of Agriculture, Idaho NRCS and the University of Idaho, or other acceptable program as designated by the State Conservationist.

The NMP shall consider all potential sources of nutrients. These sources include, but are not limited to, animal waste, composted animal waste, other composted by-products, organic by-products, waste water, commercial fertilizer, crop residues, legumes and irrigation water.

Conservation practice standards are reviewed periodically, and updated if needed. To obtain the current version of this standard, contact your Natural Resources Conservation Service State Office or download it from the electronic Field Office Technical Guide for your state.

**NRCS, IDAHO  
June 2007**

The NMP shall specify the source, amount, timing and method of application of nutrients on each field to achieve realistic production goals, while minimizing movement of nutrients and other potential contaminants to surface and/or ground waters.

The NMP shall contain all the required elements outlined in the “Plans and Specifications” section of this document. The NMP will include the nutrient budget for each field based on a current soil test, and will provide a risk assessment to determine if additional conservation practices will be required to prevent off-site movement of N and P. Off-site movement is defined as movement of N or P off the field or management unit, downward through the soil profile beyond the rooting zone, or above the canopy, of the crop to be planted.

For development of the risk assessment, acceptable soil tests are those no older than five years. If the field has a history of manure application or the management has changed significantly, then the requirement is no older than one year.

Soil samples taken for purposes of developing the annual nutrient budget shall be taken as described in Table 1, or as specified in the appropriate Fertilizer Guides (FG) or University of Idaho (UI) “Soil Sampling” publication.

The potential for loss of nutrients via erosion, runoff, irrigation and drainage shall be addressed. Individual risk factors that rate “high” or “very high,” as determined by the approved risk assessment tools, will require application of mitigating practices.

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 soils, cropping systems and soil moisture conditions (dryland).

Setbacks and buffers shall be established around sensitive areas (e.g. sinkholes, wells, gullies, ditches, surface inlets or rapidly permeable soil areas). These setbacks shall not receive direct application of nutrients from any source including sprinkler irrigation. Minimum setback

requirements are contained in the standards Riparian Forest Buffer (391) and Filter Strip (393). Rock outcrops may also pose a potential for off-site transport. Direct application of nutrients on rock outcrops should be avoided wherever feasible.

**Soil Sampling and Laboratory Analyses**

**(Testing).** Soil samples shall be collected and prepared such that they are representative of the entire Conservation Management Unit (CMU), field or portion of the field to be managed separately. Requirements for soil sampling shall follow the specifications outlined in the UI publication “Soil Sampling” (CES Number 704 <http://info.ag.uidaho.edu/resources/pdfs/ext0704.pdf>) or crop-specific soil sampling requirements outlined in the UI Fertilizer Recommendations (<http://info.ag.uidaho.edu:591/catalog/fertilizers.html>).

Soil analyses shall be performed by a laboratory that meets the requirements and performance standards of the North American Proficiency Testing Program (NAPT) under the auspices of the Soil Science Society of America.

Laboratory analysis shall include the components shown in Table 1. Soil samples will be analyzed for P using the test methods specified in the applicable UI Fertilizer Guides or other UI production publications containing nutrient guidelines.

<b>Table 1. Soil sampling requirements for annual budget development.</b>		
<b>Depth</b>	<b>Constituent Analyzed <sup>1</sup></b>	<b>Sample Date No Older Than:</b>
<b><u>Northern Idaho</u></b>		
0 - 12 inches	NO <sub>3</sub> -N, NH <sub>4</sub> -N P, K pH, % SOM <sup>2</sup> , EC <sup>3</sup>	9 months
12 – 24 inches	NO <sub>3</sub> -N	9 months
<b><u>Southern Idaho</u></b>		

0 - 12 inches	NO <sub>3</sub> -N, NH <sub>4</sub> -N	3 months
	P, K pH, % SOM <sup>2</sup> % free lime, EC <sup>3</sup>	9 months
12 – 24 inches	NO <sub>3</sub> -N, NH <sub>4</sub> -N	3 months

<sup>1</sup> In northern Idaho, P is usually analyzed using the Morgan (Sodium Acetate) method or Bray1 (Ammonium Fluoride-Hydrochloric Acid), and in southern Idaho, P is analyzed using the Olsen (Sodium Bicarbonate) method.

<sup>2</sup> SOM is soil organic matter.

<sup>3</sup> EC is electrical conductivity, salt concentration, soluble salts, etc.

**Nutrient Application Rates.** The planned rates of nutrient application, as documented in the nutrient budget, shall be applied to meet the crop needs except when manure or organic by-products are a source of nutrients. When manure or organic-matter by-products are applied, refer to “Additional Criteria Applicable to Manure and Organic By-Products or Biosolids Applied as a Plant Nutrient Source.”

**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 analysis 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:

- Apply nutrient materials uniformly to application area(s).  
Nutrients shall not be applied to frozen, snow-covered or saturated soil if the potential risk for runoff exists.
- 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.

- Calibrate waste and fertilizer application equipment to ensure recommended rates are applied.

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

**Manure and Organic By-Products Nutrient Application Methods.** In addition to previously detailed criteria, manure and organic by-product application methods shall be selected to minimize the risk of nutrient transport to surface and ground water, into the atmosphere and to reduce negative impacts on plant health. NMPs that address land application of animal waste shall comply with the Idaho Waste Management Guidelines for Confined Animal Feeding Operations (CAFOs), 1993, amended 1997 (<http://www.idahoag.us/Categories/Animals/Dairy/Documents/Idaho%20Waste%20Management%20Guidelines%20For%20Confined%20Feeding%20Operations,%20Amended%20in%201997.pdf>) and other applicable Federal, State and local rules and regulations.

**Manure Testing.** Nutrient values of manure and organic by-products shall be determined prior to land application. Samples will be taken and analyzed with each hauling/emptying cycle for a particular 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 (i.e., maintaining a certain nutrient concentration with minimal variation) level of nutrient values is realized. Significant changes in feed P ration or manure storage and handling procedures will require additional manure sampling. Samples shall be collected and prepared according to UI “Manure and Wastewater Sampling” guidance (CIS 1139) (<http://info.ag.uidaho.edu/pdf/CIS/CIS1139.pdf>)

At a minimum, manure analyses shall identify total N, P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O in pounds per ton for solids and pounds per 1,000 gallons for liquids. Percent moisture for solids and percent solids for liquids will also be identified.

In planning for new operations, acceptable “book values” recognized by the Idaho NRCS and/or the University of Idaho may be used (e.g., NRCS Agricultural Waste Management Field Handbook).

**Application of Solid Wastes.** Solid waste shall be incorporated into the soil unless applications are made on frozen ground, perennial crops or cropland under no-till. In these cases, emergency tillage (i.e., chiseling and disking cross slope), construction of berms or other containment practices will be applied as necessary to prevent surface runoff.

- Winter application of solids on 0 – 2% slope fields can be considered if there is no potential for runoff.
- Fall and winter application of solid wastes on shallow and/or sandy soils should be made when soil temperatures are <50° F to minimize loss of nitrogen.
- Solid waste applications used as part of a management system on croplands that have soils erodible by wind should utilize delayed incorporation or incorporation with chisel plow, provided there is low potential for runoff.

Biosolids (sewage sludge) shall be applied in accordance with the Idaho Department of Environmental Quality (DEQ) (<http://adm.idaho.gov/adminrules/rules/idapa58/0117.pdf>) and US Environmental Protection Agency (EPA) regulations. (40 CFR Parts 403 (Pretreatment) and 503 (Biosolids)).

**Application of Liquid Wastes.** For purposes of this standard, animal waste containing less than 10% solids will be classified as a liquid. Application of liquid waste shall not be made outside the active crop growing period unless a site-specific water budget shows that deep percolation of wastewater or runoff will not occur prior to the next crop-growing season.

Application of liquid wastes through surface or sprinkler irrigation systems will be timed to prevent deep percolation or runoff. The application rate (in/hr) of liquids shall not exceed the soil intake/infiltration rate and shall be adjusted to minimize ponding and to avoid runoff. The total application volume shall not exceed the soil water holding capacity of the soil and shall be adjusted, as needed, to minimize nutrient loss below the root zone.

**Manure and Organic By-Product Nutrient Application Rates.** Nutrient budgets which include application of animal waste shall be based upon the NRCS Idaho Phosphorus Threshold (IDPTH).

#### **Idaho Phosphorus Threshold (IDPTH)**

The IDPTH is based on a soil test P concentration. It is used:

- To determine the method for developing the nutrient budget. This could be either crop uptake or recommended application rate cited in the UI Crop Specific Fertilizer Guide.
- To track trends in soil P concentrations over time and to assess environmental risk.

Soil samples taken soon after manure, bio-solid or other organic by-product application may produce erroneous soil test results for phosphorus. Soil samples taken for the IDPTH should be delayed for 9-12 months after organic amendment applications. The on-site surface or ground water resource concern will determine the appropriate depth of the soil sample taken (Table 2) for comparison to the IDPTH:

- Surface water concerns exist when surface runoff leaves the field(s) from average annual precipitation, rain on snow or frozen ground or irrigation.
- Ground water concerns exist when surface water (from any source) does not leave the field. A high water table, fractured bedrock, poor irrigation water management, cobbles, gravel or coarse-textured soils can contribute to downward movement of water and nutrients.

When both a surface and ground water concern exists, the surface water concern governs NMP development. If neither concern exists, then the NMP is developed based on the IDPTH for the ground water concern to maintain soil quality and long-term sustainability.

Primary Resource Concern	Idaho P Threshold (IDPTH) Soil Sample Depth
Surface Water	0" – 12" <sup>1</sup>
Ground Water	18" – 24" <sup>2</sup>

<sup>1</sup> Soil samples taken for development of the IDPTH can be utilized to develop the annual nutrient budget if they meet the criteria in Table 1.

<sup>2</sup> If environmental considerations have been identified (high water tables, leaching vulnerability, tile drains, fractured bedrock, deep or shallow soils), sampling greater than or less than the prescribed depths may be necessary.

IDPTH concentrations by resource concern are listed in Table 3. Use the primary resource concern identified and site characteristics to determine the appropriate IDPTH for the site.

**Nitrogen-based manure applications are allowed** on sites where the soil test phosphorus levels are below the IDPTH (Tables 3 and 4). The nitrogen availability of the planned application shall match plant uptake characteristics as closely as possible, taking into consideration the timing of nutrient application(s) in order to minimize leaching and atmospheric losses.

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

Primary Resource Concern	Idaho P Threshold (IDPTH) Concentration		
	Olsen	Bray-1	Morgan
Surface Water	40 ppm	60 ppm	6 ppm
Ground Water			
Water < 5 feet	20 ppm	25 ppm	2.5 ppm
Water > 5 feet	30 ppm	45 ppm	4.5 ppm

**Phosphorus-based applications** are allowed on sites where soil phosphorus levels equal or exceed threshold values.

Soil Test P	P Application Rate <sup>1</sup>
< IDPTH (ppm)	Fertilizer Guide or Crop Rotational P uptake
> IDPTH (ppm)	Crop Rotational P uptake

<sup>1</sup> Phosphorus application rate is based on crop P uptake and not on crop P removal.

Where phosphorus-based applications are made, the application rate shall:

- Not exceed the recommended nitrogen application rate for the current crop during the year of application, and
- Not be made on sites considered vulnerable to off-site phosphorus transport unless appropriate conservation practices, best management practices or management activities are used to reduce the vulnerability.

**Heavy Metal Monitoring.** When sewage sludge (biosolids) 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 US Code, Reference 40 CFR, Parts 403 and 503 and/or any applicable state and local laws or regulations. Animal waste may also contain heavy metals (e.g., copper or zinc in liquid

wastes originating from hoof care products). The landowner should test for heavy metals if they are concerned or observe problems that may be associated with heavy metal contamination.

**Additional Criteria to Protect Air Quality by Reducing Nitrogen and/or Particulate Emissions to the Atmosphere**

In areas with an identified or designated nutrient management-related air quality concern, any component(s) of nutrient management (i.e., amount, source, placement, form, timing of application) identified by risk assessment tools as a potential source of atmospheric pollutants shall be adjusted, as necessary, to minimize the loss(es).

When tillage can be performed, surface applications of manure and fertilizer nitrogen formulations that are subject to volatilization on the soil surface (e.g., urea) shall be incorporated into the soil within 24 hours after application.

When manure or organic by-products are applied to grassland, hayland, pasture or minimum-till areas, the rate, form and timing of application(s) shall be managed to minimize volatilization losses.

When liquid forms of manure are applied with irrigation equipment, operators will schedule application during weather conditions that will minimize volatilization losses.

Following incorporation, manure N goes through rapid nitrification with the production of Nitrate-N. If the soil becomes saturated following this period of rapid conversion, significant N loss can occur through denitrification. Application of manure shall be done when the probability of soil saturation is low to minimize this N loss.

Operators will handle and apply poultry litter or other dry types of animal manures when the potential for wind-driven loss is low and there is less potential for transport of particulates into the atmosphere.

Weather and climatic conditions during manure or organic by-product application(s) shall be recorded and maintained in accordance with the operation and maintenance section of this

standard.

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

Nutrients shall be applied and managed in a manner that maintains or improves the physical, chemical and biological condition of the soil.

All nutrient sources should be used with the total salt load in mind for the existing soil conditions and crop to be grown.

To the extent practicable, nutrients shall not be applied when the potential for soil compaction and rutting is high.

**CONSIDERATIONS**

Individual conservation practices should be planned as part of a comprehensive conservation plan which addresses all resource concerns on the unit and reaches a Resource Management System (RMS) level of treatment.

When soil test P concentrations approach 75% of the IDPTH, consider developing the nutrient management plan using application rates at crop P uptake or less or consider growing crops that have a greater potential to remove P from the system. When soil test P concentrations are above the IDPTH, P application rates less than crop P uptake should be utilized to reduce the soil phosphorus level.

When monitoring indicates soil test P concentrations are increasing over time, consider reviewing the nutrient management plan and implementation for appropriate changes to reduce the P applied, especially when soil test P is near or above the IDPTH.

Consider varying the amount of fertilizer in different parts of the field to account for differing soil types and conditions, yield potential, fertilizer needs and the potential for leaching and runoff.

Consider applying liquid wastes mixed with irrigation water during the last 1/4 to 1/3 of the irrigation set when using in-place or non-mobile systems to minimize runoff of nutrients.

Consider split applications to provide N at the

time of maximum crop utilization, especially on fall-seeded crops.

Consider routine mineral and nutrient status testing of forages produced from land with long term and/or heavy waste application rates to protect livestock health and productivity.

Consider cover crops whenever possible to utilize and recycle excessive residual N.

Consider delaying field application of animal wastes or other organic by-products if precipitation capable of producing runoff and erosion is forecast within 24 hours of the time of the planned application.

Consider the potential problems from odors and insects associated with the land application of animal wastes especially when applied near or upwind of residences.

Consider sampling the surface layer (0-4 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.

Consider plant tissue testing. Tissue sampling and testing is encouraged during the growing season to monitor crop nutrient concentrations. Tissue sampling shall be done in accordance with the University of Idaho guidelines.

When planning nutrient applications and tillage operations, encourage soil carbon build-up and minimize the volatilization of nitrogen and the emission of greenhouse gases.

#### **Additional Consideration to Protect Water Quality on Vulnerable Sites**

Vulnerable sites are:

- Areas of average annual precipitation greater than 24 inches.
- Coarse textured soils and/or areas with high water tables (perched water less than 24 inches) with average annual precipitation greater than 21 inches or under irrigation.
- Idaho Nitrate Priority Areas and subbasins with impacted surface water (as identified in the Idaho DEQ's "Integrated Report").

Reference the UI Fertilizer Guides (FG) section "Water Quality Considerations" or sections which address N movement in soils. Specific guidance is provided in the FGs for application of N in high precipitation areas or on irrigated crops. Follow the FGs when addressing movement of N in the soil profile.

Utilize nutrient form and nutrient application timing and placement to reduce N and P pollution of ground and surface waters. Special consideration will be given to application of nutrients on sensitive areas: Highly Erodible Lands (HEL), within flood plains, near sensitive water bodies, in areas of ground water contamination within sole source aquifers, wellhead protection areas or within other areas of water quality concern.

Proper nutrient application in combination with other mitigating practices will help reduce potential of transport to gullies, ditches, surface inlets, sinkhole areas, fractured bedrock or wellhead areas. There should be no application of animal waste on sites where runoff is delivered directly to a conveyance channel or receiving water body unless runoff is treated with a conservation buffer or other mitigating practice prior to delivery.

Recommended mitigating practices include:

- Split fall/spring applications utilizing soil temperatures (<50° F), nitrification inhibitors, time release fertilizers or split spring applications of N to provide nutrients at the times of maximum crop uptake.
- Band P near the seed row.
- Incorporate broadcasted nutrients.
- Farm on the contour or cross slope on all non-irrigated fields adjacent to wetlands if nutrient runoff appears to pose a more significant hazard than leaching.
- Utilize fall cover crops whenever possible to immobilize excess residual N and retain for spring crops.
- Use Conservation Cover (327), Residue Management (329, 344, 345 or 346), Conservation Crop Rotation (328), Grassed

Waterway (412), Irrigation Water Management (449), Riparian Forest Buffers (391), Filter Strips (393), Fencing (382), Watering Facility (614), etc., as needed to protect or improve water quality.

## PLANS AND SPECIFICATIONS

Plans and specifications shall be in keeping with this standard, and shall describe the requirements for applying the practice to achieve its intended purpose.

The following components shall be included in a nutrient management plan.

- Aerial site photograph or map and a soil map
- Quantification of all nutrient sources
- Current and/or planned plant production sequence or crop rotation
- An IWM plan for fields under irrigation
- Annual soil tests
- Realistic yield goals for the crops in the rotation
- Recommended nutrient rates, timing and method of application and incorporation
- Location of designated sensitive areas or resources and the associated practices or methods planned to protect the area
- Complete nutrient budget for N, P and K for the rotation, and the annual nutrient budget for the current crop

## OPERATION AND MAINTENANCE

**Nutrient Management Plan Review and Revision.** The owner/client is responsible for the safe operation and maintenance of this practice including all equipment.

Nutrient management plans shall be reviewed annually by the producer or his/her representative to determine if significant changes in the operation have occurred that will affect the overall nutrient management plan or upon change in landowner or tenant.

Significant changes may include:

- Increase or decrease in livestock by 10%
- Major changes to waste handling and storage system
- Increase or decrease in application area by 10%
- Change in crop or crop rotation
- Change in irrigation system
- New designation as a sensitive area
- Changes in livestock type
- Changes in feed rations

Significant changes in animal numbers and/or feed management will necessitate additional manure sampling and analyses to establish a revised average nutrient content.

**Field Records.** The producer will maintain field level records for a minimum of five years; for a period longer than five years if required by other Federal, State or local ordinances; or program or contract requirements.

As applicable, records should include:

- Soil, plant tissue, organic and water test results as collected and recommendations for nutrient application
- Quantities, analyses and sources of nutrients applied
- Approximate dates and methods by which nutrients were applied
- Weather conditions and soil moisture at the time of application; lapsed time to manure incorporation, rainfall or irrigation event
- Crops planted, planting and harvest dates, yields and crop residues removed
- Dates of annual review and person performing the review, and recommendations that resulted from the review
- Any additional information as required by this standard (e.g., site vulnerability, risk assessment, biosolids application records and other appropriate cautions and discussions).



- Irrigation water management evaluations as applicable
- Documentation of the actual rate at which nutrients were applied. When the actual rates used differ from the recommended and planned rates, records will indicate the rationale.

**Annual Nutrient Budget.** Soil samples used to develop the annual nutrient budget shall meet the criteria in Table 1.

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

- Nitrogen (N), Phosphorus (P) and Potassium (K) application rates shall match the FG recommended rates as closely as possible, or within reasonable limits, except when manure or organic by-products are a source of nutrients. Reasonable limits are defined as 40 lbs-N, 20 lbs-P<sub>2</sub>O<sub>5</sub> and 40 lbs-K<sub>2</sub>O per acre.
- When the applied fertilizer rate exceeds the reasonable limits defined above, the application must be justified by either a pre-application soil test or an approved tissue test or feed analysis. For over-application of N without justification, a post-harvest rooting depth soil test will be required.
- Potassium shall not be applied in situations in which excess K<sub>2</sub>O causes unacceptable nutrient imbalances in crops or forages.
- The planned rates of application of other plant nutrients shall be consistent with the University of Idaho Nutrient Recommendations.
- A starter band of up to 30 lbs of P<sub>2</sub>O<sub>5</sub> per acre is allowed under special localized conditions (wet-cold or high P fixing soils) regardless of soil test. When starter fertilizers are used, they shall be applied in accordance with UI recommendations.

**Safety.** Workers should be protected from and avoid unnecessary contact with chemical fertilizers and organic by-products. Protection should 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.

Protect fertilizer and organic by-product storage facilities from weather and accidental leakage or spillage. Storage of manure, fertilizers and cleaning of application equipment should be done away from a wellhead.

Calibrate application equipment to ensure uniform distribution of material at planned rates.

Backflow protection devices shall be installed according to Idaho chemigation requirements when using irrigation systems for application or distribution of liquid waste or commercial fertilizer.

The disposal of material generated from cleaning nutrient application equipment should be stored and disposed of properly. 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 and leaching.

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

## REFERENCES

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ID-590-10

Service, ARS-149.