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 plant nutrients and soil amendments.

PURPOSE

- To budget and supply nutrients for plant production.
- To properly utilize manure or organic by-products as a plant nutrient source.
- To minimize agricultural nonpoint source pollution of surface and ground water resources.
- To protect air quality by reducing nitrogen emissions (ammonium and NO_x 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 except for small plots where nutrient and soil amendment application is limited (e.g., wildlife food plots less than one acre).

CRITERIA

General Criteria Applicable to All Purposes

Plans for nutrient management need to comply with all applicable Federal, state, and local laws, rules, and regulations, (e.g., 1994 amendment to the Florida Fertilizer Law Chapter 576, Florida Statue (F.S.), http://www.leg.state.fl.us/Statutes/index.cfm?App_mode=Display_Statute&URL=Ch0576/ch0576.htm
Domestic Wastewater Residuals, Chapter 62-640 Florida Administrative Code (F.A.C.), http://www.dep.state.fl.us/legal/Rules/wastewater/62-640.pdf
Disposal of Septage, Chapter 64E-6 F.A.C.) http://www.doh.state.fl.us/environment/ostds/pdfiles/forms/64e620061126.pdf

Plans for nutrient management need to be developed in accordance with 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, Nutrient Management; technical requirements of the NRCS Field Office Technical Guide (FOTG); procedures contained in the National Planning Procedures Handbook (NPPH), and the NRCS National Agronomy Manual (NAM) Section 503.

Impact to cultural resources, wetlands, and Federal and State protected species needs to be determined prior to implementation of this practice. Any impacts need to be avoided or minimized to the extent practical during planning, design and implementation of this conservation practice in accordance with established National and Florida NRCS policy, General Manual (GM) Title 420-Part 401, Title 450-Part 401, and Title 190-Parts 410.22 and 410.26; National Planning Procedures Handbook (NPPH) FL Supplements to Parts 600.1 and 600.6; National Cultural Resources Procedures Handbook (NCRPH); and The

National Environmental Compliance Handbook (NECH).

Persons who review or approve plans for nutrient management need to be certified through any certification program acceptable to Florida NRCS.

A review of the nutrient management plan needs to be performed, as a minimum, every five years. An annual review is encouraged. A person properly certified needs to approve all revisions.

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

A nutrient budget for nitrogen, phosphorus, and potassium will consider 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.

Realistic yield goals need to be established based on soil productivity information, historical yield data, climatic conditions, level of management, local research on similar soil and cropping systems, and soil and manure/organic by-products tests. For new crops or varieties, industry yield recommendations may be used until documented yield information is available.

Plans for nutrient management shall specify the source, amount, timing and method of application of nutrients on each field or area planned, to achieve realistic production goals and mitigation practices or efforts that minimize the movement of nutrients and other potential contaminants to surface and/or ground waters.

Do not directly apply nutrients to areas such as sinkholes, wells, gullies, ditches, surface inlets or rapidly permeable soil areas.

Address the amount of nutrients lost to erosion, runoff, irrigation and drainage, as needed.

Soil Sampling and Laboratory Analysis (Testing). Base nutrient planning on current soil and tissue (where used as a supplement) test results developed in accordance with University of Florida, Institute of Food and Agricultural Sciences (UF/IFAS) guidance or industry practice recognized by UF/IFAS.

A current soil test is one that is no older than **one year** for all land uses where nutrients or organic by-products are applied. For pasture and hayland where nutrients are applied at maintenance levels, a soil test shall be no older than **five years** is considered current.

Soil and tissue samples need to be collected and prepared according to UF/IFAS guidance or standard industry practice. Soil and tissue test analyses need to be performed by laboratories that are accepted in one or more of the following:

- Laboratories successfully meeting the requirements and performance standards of the North American Proficiency Testing Program (NAPT) under the auspices of the Soil Science Society of America, or
- State recognized program that considers laboratory performance and proficiency to assure accuracy of soil test results, and
- Laboratories whose tests are performed by the same method and guidelines as UF/IFAS.

Soil and tissue testing need to include analysis for any nutrient for which specific information is needed to develop the nutrient management plan and is pertinent to monitoring or amending the annual nutrient budget, (e.g., pH, electrical conductivity (EC), soil organic matter, nitrogen, phosphorus, and potassium).

Nutrient Application, Rates. Base nutrient application rates for commercial fertilizer on UF/IFAS recommendations: which includes the latest version of the SL – 129 and/or industry practice where calibration curves have been developed and meets UF/IFAS approval and considers current soil test results, realistic yield goals and landowner management capabilities. See “Additional Criteria Applicable to Properly Utilize Manure or Organic By-Products Applied as a Plant Nutrient Source” section for recommended nutrient application rates for manure or organic by-products.

If UF/IFAS does not provide specific recommendations, base nutrient application on realistic yield goals and associated plant nutrient uptake rates.

When needed, recommendations will include soil amendments to adjust soil pH to an adequate level for crop nutrient availability and utilization.

Determine the planned rates of nutrient application, as documented in the nutrient budget, based on the following guidance:

- **Nitrogen Application** - Planned nitrogen application rates will match the recommended rates as closely as possible, except when manure or other organic by-products are a source of nutrients. When manure or other organic by-products are a source of nutrients, see "Additional Criteria Applicable to Properly Utilize Manure or Organic By-Products Applied as a Plant Nutrient Source."

- **Phosphorus Application -** Planned phosphorus application rates will match the recommended rates as closely as possible, except when manure or other organic by-products are a source of nutrients. When manure or other organic by-products are a source of nutrients, see "Additional Criteria Applicable to Properly Utilize Manure or Organic By-Products Applied as a Plant Nutrient Source."

- **Potassium Application** – Potassium application rates will be accounted for in the nutrient budget. Potassium will not be applied in situations in which excess (greater than soil test potassium recommendation) causes unacceptable nutrient imbalances in crops or forages. If high levels of potassium in the forage are associated with milk fever or other forage quality problems, reduce potassium application rates to an acceptable level.

- **Other Plant Nutrients -** The planned rates of application of other nutrients need to be consistent with UF/IFAS guidance or industry practices recognized by UF/IFAS.

- **Starter Fertilizers** – When starter fertilizers are used, they need to be included in the overall nutrient budget and applied in accordance with UF/IFAS recommendations, or industry practice recognized by UF/IFAS.

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

Nutrient Application, Methods. Use application methods that reduce the risk of nutrient transport to surface and ground water, or into the atmosphere.

To minimize nutrient losses:

- Apply nutrient materials uniformly to application area(s).

- Nutrients will not be applied to saturated soil if potential runoff risks exist.

- Apply nutrients 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.

- Nutrient applications associated with irrigation systems (i.e., chemigation) must be applied in accordance with the requirements of Florida NRCS Conservation Practice Standard, Irrigation Water Management, Code 449.

Do not exceed the soil infiltration rate (in/hr) when applying nutrients through irrigation systems. Do not exceed field capacity of the soil during any single application.

Areas of Concern. Application sites located in geographic areas that have been identified by statute or rule of Florida Department of Environmental Protection (FDEP) as being subject to restrictions on phosphorus loading (such as the Everglades Protection Area, Lake Apopka, Lake Okeechobee, and the Green Swamp Area) need to follow any additional requirements required in Chapter 62-640 F.A.C. (http://www.dep.state.fl.us/legal/Rules/wastewater/62-640.pdf)

In areas with identified or designated nutrient-related water quality impairment, an assessment must be completed of the potential for nitrogen and/or phosphorus transport from the field. The Leaching Index (LI) and/or Phosphorus Index (http://efotg.nrcs.usda.gov/references/public/FL/TheFloridaPhosphorusIndex080404Final.pdf) , or other assessment tools approved by the State Conservationist may be used to make these assessments. The results of these assessments and recommendations must be discussed with the producer and included in the nutrient management plan.

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

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 Conservation Management Unit (CMU) must be completed to adjust the amount, placement, form, and timing of application of nutrient sources, as recommended by UF/IFAS.

Nutrient Values. Determine nutrient values of manure and organic by-products prior to land application. Samples need to be taken and analyzed for 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, an annual analysis of the manure needs to be made for a minimum or three consecutive years. A cumulative record needs to be developed and maintained until a consistent (maintaining a certain nutrient concentration with minimal variation) level of nutrient values is realized. Base the nutrient allocation to fields on the average of results contained in the operation's cumulative manure analyses history. Collect and prepare samples according to UF/IFAS guidance or industry practice.

In planning for new operations, acceptable "book values" recognized by NRCS and/or UF/IFAS may be used if they accurately estimate nutrient output from the proposed operation. Book values recognized by NRCS may be found in the Agricultural Waste Management Field Handbook (AWMFH), Chapter 4 - Agricultural Waste Characteristics.

Apply biosolids (sewage sludge) in accordance with USEPA regulations (40 CFR Parts 403 (Pretreatment) and 503 (Biosolids) (http://www.epa.gov/npdes/regulations/streamlining_part403.pdf) and (http://www.epa.gov/owm/mtb/biosolids/503pe/index.htm) and Florida State Chapter 62-640 rule. If the biosolids are septage from septic tanks, then follow Florida Health Department's Chapter 64E-6 F.A.C (http://www.doh.state.fl.us/environment/ostds/pdfiles/forms/64e620061126.pdf)

Nutrient Budget. The determination to apply nutrients according to a nitrogen based budget or a phosphorus-based budget needs to be made by using the field risk assessment "Florida Phosphorus Index (P Index)."

Nutrient management plans shall include

(1) a record of the assessment for each field or sub-field, and

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

When such assessments are completed, discuss the results of the assessment and recommendations with the producer during the development of the nutrient management plan.

Nutrient Application. Base manure and organic by-product nutrient application rates on nutrient analyses procedures recommended by UF/IFAS. 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.

Make sure the application rate (in/hr) of liquid materials does not exceed the soil intake/infiltration rate; this rate needs to be adjusted to minimize ponding and to avoid runoff. Make sure the total application does not exceed the field capacity of the soil and adjust the amount, as needed, to minimize loss to subsurface tile drains.

Use the following guidance to determine the planned rates of nitrogen and phosphorus application recorded in the plan:

Nitrogen Application Rates

- When manure or organic by-products are used, match the nitrogen availability of the planned application rates to plant uptake characteristics as closely as possible, taking into consideration the timing of nutrient application(s) in order to minimize leaching and atmospheric losses. There are several sources of crop uptake data that can be used. Crop uptake data sources are found in the Agricultural Waste Management Field Handbook (AWMFH), Chapter 6 – Nutrient Removal by Harvesting of Crop.
- Use management activities and technologies that effectively utilize mineralized nitrogen and that minimize nitrogen losses through denitrification and ammonia volatilization.

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

Phosphorus Application Rates

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

(1) Index.

a) Use nitrogen based management budget on sites rated Low or Medium Risk.

b) Use phosphorus based management budget on sites rated High Risk.

c) Use phosphorus based management budget at less than crop removal or no manure application for sites rated Very High Risk.

(2) Soil Test**.** Phosphorus may be applied at rates based on UF/IFAS recommendations from an accepted soil test. Use nitrogen-based manure application on sites for which the soil test recommendation calls for phosphorus application. Use phosphorus-based or no manure application on sites for which the soil test recommendation calls for no phosphorus application

(3) Florida Department of Environmental Protection (FDEP). Section I of the FOTG lists Hydrological Unit Areas (HUA) and/or application sites that contribute to specific water bodies where additional phosphorus application is permitted FDEP. Nitrogen based budget can be used on these sites.

A single application of phosphorus applied from manure may be made at a rate equal to the recommended phosphorus application or estimated phosphorus removal in harvested plant biomass for the crop rotation or multiple years in the crop sequence. When such applications are made, the application rate shall:

(1) not exceed the recommended nitrogen application rate during the year of application,

or

(2) not exceed the estimated nitrogen removal in harvested plant biomass during the year of application when there is no recommended nitrogen application,

Regardless of nitrogen application rate used do not apply manures on sites considered vulnerable to off-site phosphorus transport unless appropriate conservation practices, best management practices, or other management activities are used to reduce the vulnerability to an acceptable level.

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 will be monitored in accordance with the US Code, Reference 40 CFR, Parts 403 and 503, and Domestic Wastewater Residuals, Chapter 62-640 F.A.C. will be followed.

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

Buffers. For protection of water quality, provide buffers between the area receiving nutrients and the area to be protected. Buffers need to be constructed and/or maintained at the minimum buffer widths in Table 1 when applying manures and organic by-products, unless written justification is provided.

When applying commercial fertilizer the minimum buffer width will be based on the criteria found in the conservation practice standard for the type of buffer that is used.

Buffers include but are not limited to Florida NRCS Conservation Practice Standards; Filter Strip, Code 393; Riparian Forest Buffer, Code 391; Contour Buffer Strips, Code 332; Grassed Waterway, Code 412; Field Border, Code 386.

Buffers may need supplemental fertilization, which will be based on a soil test and on UF/IFAS recommendations.

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, adjust as necessary, any component(s) of the nutrient management plan (i.e., amount source, placement, form, timing of application) identified by risk assessment tools as a potential source of atmospheric pollutants to minimize the loss(es).

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

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

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

Operators need to 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.

Record weather and climatic conditions during manure or organic by-product application(s) and these records need to be 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

Apply and manage nutrients in a manner that maintains or improves the physical, chemical and biological condition of the soil.

Minimize the use of nutrient sources with high salt content unless provisions are made to leach salts below the crop root zone.

Do not apply nutrients to flooded or saturated soils when the potential for soil compaction and creation of ruts is high.

Table 1 **-** Non-Application Buffer Widths when applying manures and organic by-products[1/]

Object, Site	**Situation**	**Base Buffer Width from Object, Site** (ft.)
Ag Well, non-potable	No permanent or insufficient vegetated setback[5/]	100
Ag Well, non-potable	Permanent vegetated setback[5/]	35
Waterbody, Stream[2/], sinkhole or wetland	No permanent or insufficient vegetated setback[5/]	100
Waterbody, Stream[2/], sinkhole or wetland	Permanent vegetated setback[5/]	35
Well, potable	Located up-slope of application site	150
Well, potable	Located down-slope of application site provided conditions warrant application	300
Well, potable	Dairies in the Okeechobee Basin[4/] Commerical Egg Production Facility[4/]	200
Waterbody, Stream[2/], sinkhole or wetland or drainage ditches	Good vegetation [3/]. Add 2 feet for each 1% slope for slopes up to 8%. Dairies in the Okeechobee Basin[4/] Commerical Egg Production Facility[4/]	50 (+)
Waterbody, Stream[2/], sinkhole or wetland	Poor vegetative cover or Predominant slope > 8%[3/]	100

Public Road – roadside ditch	Irrigated wastewater or solids applied with spreader	30

[1/] Research has shown that forested or forest/grass buffers are more effective at removing phosphorus. Grass buffers are more effective at removing nitrogen. Every effort should be made to reduce phosphorus inputs at their sources. If phosphorus is managed responsibly on-site, buffers can store significant amounts of the excess; but if phosphorus is uncontrolled buffers can quickly become saturated and over whelmed. Even with their limits, buffers still perform a valuable service by displacing phosphorus-producing activities away from streams and regulating the flow of phosphorus. Taken in part from "A Review Of The Scientific Literature On Riparian Buffer Width, Extent And Vegetation", Institute of Ecology, University of Georgia.

[2/] Waterbody includes pond, lake, or open sinkhole. Open sinks include paleo sinks without a confining layer within 80 inches of the surface. Stream includes both perennial and intermittent streams and canals.

[3/] Good vegetation refers to a well-managed, dense stand that is not overgrazed.

[4/] These setbacks are in the State of Florida DEP 62-670 Rule Feedlot and Dairy Wastewater Treatment and Management Requirements for all dairy farms in the Okeechobee basin that originated after June 3, 1987. These setbacks are also required of Commercial Egg Production Facilities – Statewide.
http://www.dep.state.fl.us/legal/Rules/wastewater/62-670.pdf

[5/] If a livestock operation has been designated a CAFO then these setbacks will be followed.
http://www.epa.gov/npdes/regulations/cafo_fedrgstr_part412.pdf

CONSIDERATIONS

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

The addition of these management activities, when applicable, increases the management intensity of the system and is recommended in a nutrient management system.

Areas that contribute to the excess nutrients in surface and/or groundwater are considered sensitive areas. Realize that some areas may be considered sensitive on some sites where they may not be sensitive on other sites, e.g., paleo sinks may have restrictive soil layers.

Do not apply waste/wastewater within 3 days of likely rainfall or during periods of frequent rainfall in a defined drainage way(s) that carries concentrated flow. Such material may be applied to newly constructed grass waterways if incorporated immediately.

Nutrient deficiencies may be induced in plants due to excessive levels of other nutrients or soil chemistry. Consider additional practices and combinations of practices such as Florida NRCS Conservation Practices, Conservation Cover, Code 327; Grassed Waterway, Code 412; Contour Buffer Strips, Code 332; Filter Strips, Code 393; Field Border, Code 386; Irrigation Water Management, Code 449; Riparian Herbaceous Cover, Code 390; Riparian Forest Buffer, Code 391; Conservation Crop Rotation, Code 328; Cover Crop, Code 340; and Residue Management, Codes 329, 345, or 346, and 344 to improve nutrient storage, water storage, infiltration, aeration, soil tilth, diversity of soil organisms, and to protect or improve water quality.

If increases in soil phosphorus levels are expected, consider using a more frequent (annual) soil testing interval.

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

Consider nitrogen volatilization and other losses associated with the land application of animal manure. Volatilization losses can become significant, if manure is not immediately incorporated into the soil after application.

Consider annual reviews to determine if changes in the nutrient budget are needed for the next planned crop.

On sites where there are special environmental concerns, consider other sampling techniques, (e.g., soil profile sampling for nitrogen, Pre-Sidedress Nitrogen Test [PSNT], Pre-Plant Soil Nitrate Test [PPSN] or soil surface sampling for phosphorus accumulation or pH changes).

Consider ways to modify the chemistry of animal manure, including modification of the animal's diet to reduce the manure nutrient content and/or to enhance the producer's ability to manage manure effectively, (e.g., adding alum to waste, feeding high phytase corn to poultry, switching to a pasture based grazing system, grow more on-site feed, or reducing the amount of phosphorus in the feed ration for dairy cows, and/or poultry).

Considerations to Minimize Agricultural Nonpoint Source Pollution of Surface and Ground Water.

Erosion control and runoff reduction practices can improve soil nutrient and water storage, infiltration, aeration, tilth, diversity of soil organisms and protect or improve water and air quality.

Consider cover crops whenever possible to utilize and recycle residual nitrogen.

Where phosphorus is a potential water quality concern, consider planting crops with the capability of maximum removal of phosphorus.

Apply nutrient materials uniformly to the application area. Application methods and timing that will reduce the risk of nutrients being transported to ground and surface waters, or volatilizes into the atmosphere include:

- Split applications of nitrogen to provide nutrients at the times of maximum crop utilization,
- Applying nutrients based on plant physiology and climate factors, i.e., avoid winter nutrient applications for spring seeded crops, avoid application to dormant crops, apply so the stage of the planned crop can utilize the nutrients.
- Band applications of phosphorus near the seed row,
- Applying nutrient materials uniformly to application areas or as prescribed by precision agricultural techniques,
- Incorporate surface applied manures or organic by-products as soon as possible after application to minimize nutrient losses,
- Delaying field application of animal manures or other organic by-products if precipitation is capable of producing runoff and erosion is forecast within 24 hours of the time of the planned application.

Considerations to Protect Air Quality by Reducing Nitrogen and/or Particulate Emissions to the Atmosphere.

Odors associated with the land application of manures and organic by-products can be offensive to the occupants of nearby homes. Avoid applying these materials upwind of occupied structures when residents are likely to be home (evenings, weekends and holidays).

Table 2, provides suggested non-application buffer areas. Use of one or more wind buffer conservation practices should be considered when establishing buffers for odor control (e.g., Herbaceous Wind Barriers, Code 603, and Windbreak/Shelterbelt Establishment, Code 380).

Table 2 – Suggested Non-Application Buffer Widths for odor control

Object, Site	**Situation**	**Base Buffer Width from Object or Site** (ft.)
Public Road and Property Lines	Irrigated wastewater and solids applied with spreader truck	50
Dwelling	Other than Producer	300
Public Use Area	All	300

When applying manure with irrigation equipment, adjustments such as reducing the pressure, using drop down tubes for center pivots, etc., can reduce the potential for volatilization of nitrogen from the time the manure leaves the application equipment until it reaches the surface of the soil. Nitrogen volatilization from manure in a surface irrigation system will be reduced when applied under a crop canopy.

When planning nutrient applications and tillage operations consider using no-till or strip-till operations, which lessens soil disturbance and encourages soil carbon buildup while discouraging greenhouse gas emissions (e.g., nitrous oxide N_2O, carbon dioxide CO_2).

Make nutrient applications associated with irrigation systems in accordance with the requirements of Florida NRCS Conservation Practice Standard, Irrigation Water Management, Code 449.

CAFO operations seeking permits under USEPA regulations (40 CFR Parts 122 and 412) should consult with Florida Department of Environmental Regulation for additional criteria.

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(s), using nutrients to achieve production goals and to prevent or minimize water quality impairment.

Nutrient management plans need to include a statement that the plan was developed based on the requirements of the current standard and any applicable Federal, state, or local rules, regulations, policies, or programs, which may affect the implementation of this practice 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) current and/or planned plant production sequence or crop rotation;

(3) results of soil, water, manure and/or organic by-product sample analyses;

(4) results of plant tissue analyses, when used for nutrient management;

(5) realistic yield goals for the crop(s);

(6) listing and quantification of all nutrient sources;

(7) CMU specific recommended nutrient application rates, timing, form, and method of application and incorporation;

(8) location of designated sensitive areas or resources and the associated nutrient management restriction;

(9) guidance for implementation, operation, maintenance, recordkeeping; and

(10) complete nutrient budget for nitrogen, phosphorus, and potassium for the crop rotation or sequence.

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

- the soil phosphorus levels at which it may be desirable to convert to phosphorus based planning,
- results of appropriate risk assessment tools to document the relationship between soil phosphorus levels and potential for phosphorus transport from the field,
- the potential for soil phosphorus drawdown from the production and harvesting of crops, and
- management activities or techniques used to reduce the potential for phosphorus loss.

OPERATION AND MAINTENANCE

The owner/client is responsible for safe operation and maintenance of this practice including all equipment. Operation and maintenance addresses the following:

- Periodic plan review to determine if adjustments or modifications to the plan are needed. At a minimum, plans will be reviewed and revised with each soil test cycle.
- Significant changes in animal numbers and/or feed management will necessitate additional manure sampling and analyses to establish a revised average nutrient content.

- Protection of fertilizer and organic by-product storage facilities from weather and accidental leakage or spillage.
- Calibration of application equipment to ensure uniform distribution of material at planned rates.
- Documentation of the actual rate at which nutrients were applied. When the actual rates used differ from the recommended and planned rates, the records will indicate the reasons for the differences.
- Maintaining records to document plan implementation. As applicable, records include:

  (1) soil, plant tissue, water, manure, and organic by-product analyses resulting in recommendations for nutrient application;

  (2) quantities, analyses and sources of nutrients applied;

  (3) dates and method(s) of nutrient applications;

  (4) weather conditions and soil moisture at the time of application; lapsed time to manure incorporation, rainfall or irrigation event;

  (5) crops planted, planting and harvest dates, yields, and crop residues removed; and

  (6) dates of plan review, name of reviewer, and recommended changes resulting from the review.

Records will 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.

Workers should be protected from and avoid unnecessary contact with plant nutrient sources. Extra caution must be taken when handling ammoniacal sources of nutrients, or when dealing with organic wastes stored in unventilated enclosures.

Utilize material generated from cleaning nutrient application equipment in an environmentally safe manner. Excess material should be collected and stored or field applied in an appropriate manner.

Nutrient containers should be recycled in compliance with state and local guidelines or regulations.

REFERENCES

"A Review Of The Scientific Literature On Riparian Buffer Width, Extent And Vegetation", Institute of Ecology, University of Georgia

Chapter 62-640 F.A.C.
http://www.dep.state.fl.us/legal/Rules/wastewater/62-640.pdf

Chapter 64E-6 F.A.C.
http://www.doh.state.fl.us/environment/ostds/pdfiles/forms/64e620061126.pdf

Chapter 62-670 F.A.C.
http://www.dep.state.fl.us/legal/Rules/wastewater/62-670.pdf

USEPA CAFO Rules
http://www.epa.gov/npdes/regulations/cafo_fedrgstr_part412.pdf

USEPA 40 CFR Parts 403 and 503 (http://www.epa.gov/npdes/regulations/streamlining_part403.pdf) and (http://www.epa.gov/owm/mtb/biosolids/503pe/index.htm

Florida Fertilizer Law Chapter 576, F.S.
http://www.leg.state.fl.us/Statutes/index.cfm?App_mode=Display_Statute&URL=Ch0576/ch0576.htm

NRCS FOTG, Section I and Section III

Phosphorus Index, Exhibit 1, Chapter 9, Florida Agronomy Field Handbook
http://efotg.nrcs.usda.gov/references/public/FL/TheFloridaPhosphorusIndex080404Final.pdf

NRCS General Manual Title 450, Part 401.03 and Title 190, Part 402

NRCS National Planning Procedures Handbook (NPPH)

NRCS National Agronomy Manual (NAM) Section 503.

NRCS Agricultural Waste Management Field Handbook, Chapters 4, 6, and 11

Florida NRCS Conservation Practice Standards:
Conservation Cover, Code 327
Conservation Crop Rotation, Code 328
Contour Buffer Strips, Code 332
Cover Crop, Code 340
Field Border, Code 386
Filter Strips, Code 393
Grassed Waterway, Code 412
Herbaceous Wind Barriers, Code 603
Irrigation Water Management, Code 449
Residue Management, Codes 329, 345, or 346, and 344
Riparian Forest Buffer, Code (391),
Riparian Herbaceous Cover, Code 390
Windbreak/Shelterbelt Establishment, Code 380