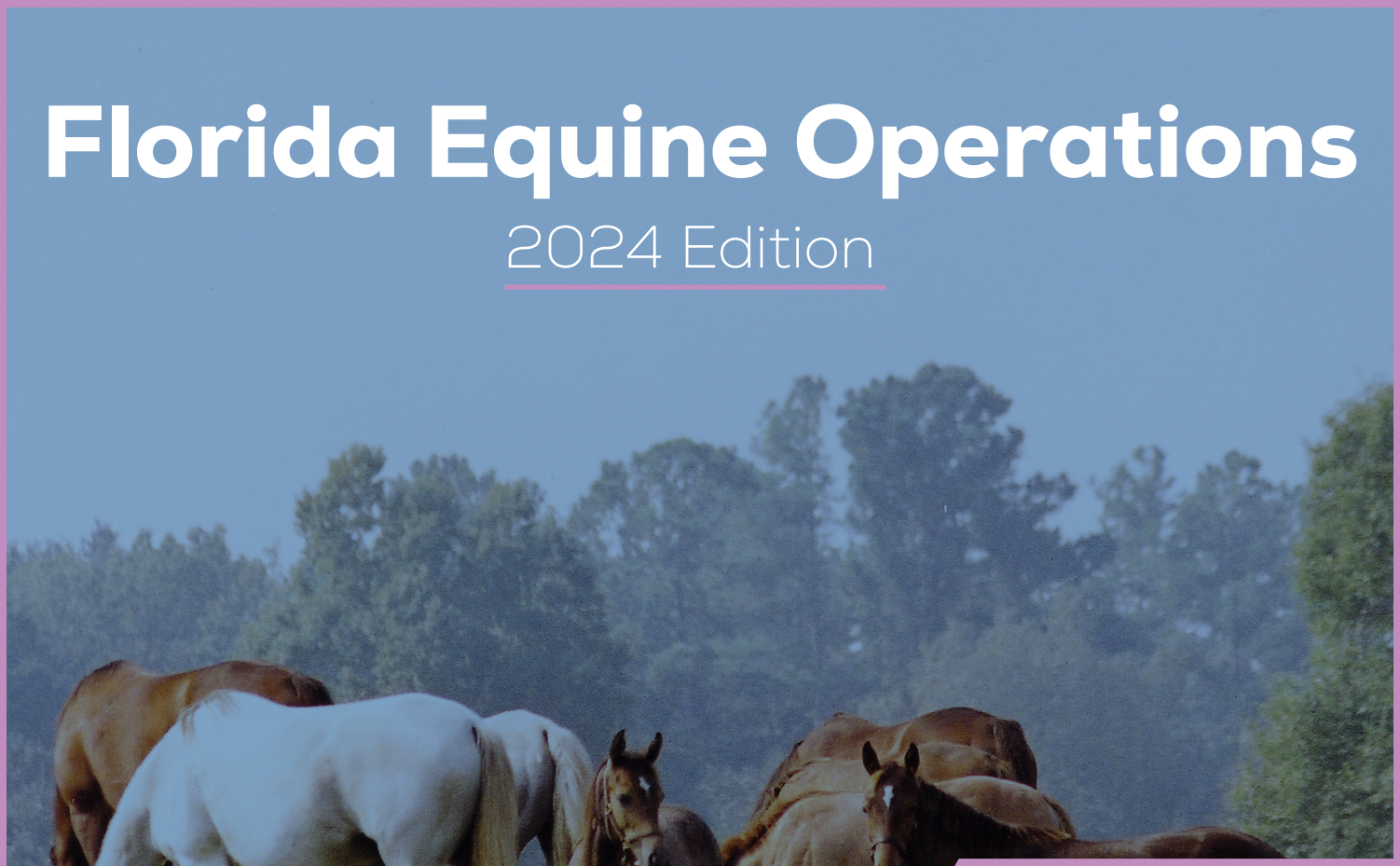
Florida Equine Operations

2024 Edition



Water Quality and Water Quantity Best Management Practices

FDACS-P-01531 Rev. 11/24

FLORIDA EQUINE OPERATIONS, 2024 EDITION: WATER QUALITY AND WATER QUANTITY BEST MANAGEMENT PRACTICES

Publication No. FDACS-P-01531, rev. 11/24, Incorporated in Rule 5M-14.002, Florida Administrative Code.

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Acronyms and Abbreviations

BMAP	Basin Management Action Plan
BMP	Best Management Practice
CPS	Conservation Practice Standard
EDIS	Electronic Data Information Source of UF/IFAS
EEF	Enhanced Efficiency Fertilizer
EPA	United States Environmental Protection Agency
ERP	Environmental Resource Permit
ET	Evapotranspiration
F.A.C.	Florida Administrative Code
F.S.	Florida Statutes
FAWN	Florida Automated Weather Network
FDACS	Florida Department of Agriculture and Consumer Services
FDEP	Florida Department of Environmental Protection
HIA	High Intensity Use Area
IV	Implementation Verification
MIL	Mobile Irrigation Laboratory
N	Nitrogen
N/A	Not Applicable
NARF	Nutrient Application Record Form
NOI	Notice of Intent to Implement Best Management Practices
NRCS	Natural Resources Conservation Service
OAWP	Office of Agricultural Water Policy (FDACS)
OFS	Outstanding Florida Springs
P_2O_5	Phosphorus pentoxide
P	Phosphorus
TMDL	Total Maximum Daily Load
UF/IFAS	University of Florida, Institute of Food and Agricultural Sciences
WMD	Water Management District

Part A

Introduction

Florida's equine industry is diverse, consisting of multiple breeds and use categories. According to the 2023 American Horse Council National Economic Impact Report (AHC, 2023), the state is represented by all major breeds and many unique and rare breeds of horses. Thoroughbreds represent one in four horses within the state totaling 87,600 animals, making Thoroughbreds the states' dominant breed by number and economic impact. Quarter Horses represent the second largest breed category with 71,474 animals, or approximately 21% of the horses in Florida. Standardbreds number 29,704 animals. All other breeds combined total 143,752 animals. Equine operations include breeding, boarding, training horses for racetracks, worldwide auctions, performance or competition horses, therapeutic, quarantine, barrel racing, hunter/jumper operations, rodeo event, polo, carriage driving centers, and pleasure-riding. The highest density of equine operations in the state is in Marion County.

According to the 2023 American Horse Council (AHC) Report, the equine industry contributed $177 billion to the U.S. economy with an economic impact of $12.78 billion in Florida, which is more than all collegiate sports in the state. With more than 332,000 horses, Florida ranks third in the number of equines in the United States, behind Texas and California.

The millions of acres of pasture and rangelands throughout Florida provide significant benefits to society and the environment. In addition to providing an important agricultural commodity to the state, properly managed grazing lands naturally filter pollutants from runoff water, reduce soil erosion, replenish groundwater supplies, capture carbon dioxide, release oxygen to the atmosphere, help to cool surrounding surface temperatures, provide greenspace and wildlife habitat (including habitat for endangered species) and provide aesthetic and recreational value. The AHC report found that 561,000 acres are preserved and used for horse-related purposes within the state, with 210,000 of those acres in Marion County, and 195,000 of those acres designated in the county's Farmland Preservation Area.

Operations Applicable to this Manual

This manual applies to equine operations including boarding, breeding, and training operations. Commercial hay production activities not associated with equine operations are covered in the Vegetable and Agronomic Crops manual adopted in Rule Chapter 5M-8, Florida Administrative Code (F.A.C.),(https://www.fdacs.gov/Agriculture-Industry/Water/Agricultural-Best-Management-Practices). A landowner or producer enrolled under this manual is also subject to the requirements of Rule Chapter 5M-1, F.A.C.

To benefit from and participate in the Best Management Practices (BMP) Program, Equine operations must work with a Florida Department of Agriculture and Consumer Services (FDACS) representative to complete, sign, and submit a Notice of Intent (NOI) (FDACS-04002, rev. 06/24, incorporated in Rule 5M-1.001(9), F.A.C.), and the BMP Checklist that is part of this manual.

A landowner or producer operating under one of the Equivalent Programs listed in Rule 5M-1.001(7), F.A.C., is required to complete a Notice of Intent and meet the other requirements for Equivalent Programs specified in Rule Chapter 5M-1, F.A.C.

Completing a BMP Checklist is not required for the enrolled lands subject to the permit or license issued pursuant to an Equivalent Program listed in Rule 5M-1.001(7)(a) or (b), F.A.C. Whether or not an enrollee under an Equivalent Program listed in Rule 5M-1.001(7)(c) or (d), F.A.C., is

required to complete a Checklist depends on the specific requirements of the programs identified. References to the BMP Checklist in this manual apply to Equivalent Program enrollments only to the extent provided in Rule Chapter 5M-1, F.A.C.

Enrollees under an Equivalent Program listed in Rule 5M-1.001(7), F.A.C., and meeting the requirements for Equivalent Programs provided in Rule Chapter 5M-1, F.A.C., are provided all the benefits listed under "Benefits of Implementing BMPs" set forth below.

High Intensity Use Areas (HIA) that are created through typical equine operation activities, such as feeding areas or arenas, are allowed, providing there is no untreated, direct discharge from the HIA off site.

Best Management Practices and Water Quality

Section 403.067, Florida Statutes (F.S.), directs the Florida Department of Environmental Protection (FDEP) to develop water quality restoration goals for impaired waterbodies. These water quality restoration goals, or total maximum daily loads (TMDLs), are the maximum amount of a pollutant that a waterbody can assimilate and remain suitable for its designated use. Once a total maximum daily load (TMDL) is adopted, FDEP may develop a basin management action plan (BMAP) that identifies enforceable strategies for restoring the impaired waterbody. The agricultural industry is one of many stakeholders identified in most BMAPs and plays an important role in helping to meet these water quality goals. Florida law requires agricultural producers and landowners located within BMAP areas to either enroll in the FDACS BMP Program and properly implement BMPs applicable to their property and operation, or to conduct water quality monitoring activities as required by Rule Chapter 62-307, F.A.C. FDACS strongly encourages producers and agricultural landowners outside BMAP areas to also enroll in the BMP Program for the many benefits that enrollment provides. Proper implementation of the FDACS agricultural BMPs is the industry's strategy to address agricultural nonpoint pollution sources.

The FDACS Office of Agricultural Water Policy (OAWP) administers the BMP Program for equine operations. For the purposes of the OAWP BMP Program, the term "best management practice" means, a practice or combination of practices determined by the coordinating agencies (FDACS, FDEP, and water management districts (WMDs)), based on research, field-testing, and expert review, to be the most effective and practicable on-location means, including economic and technological considerations, for improving water quality in agricultural discharges. BMPs must reflect a balance between water quality improvements and agricultural productivity. Section 403.067, F.S., authorizes and directs FDACS to develop and adopt by rule BMPs that will help Florida's agricultural industry achieve the reductions allocated in BMAPs. BMPs serve as part of a multidisciplinary approach to water resource restoration and protection that includes public/private partnerships, landowner agreements, and regional treatment technologies, which together form the comprehensive strategy needed to meet goals established in BMAPs.

Producers or agricultural landowners who are enrolled in the FDACS BMP Program and properly implementing the applicable BMPs identified on the BMP Checklist or who are in compliance with the Equivalent Program requirements of Rule Chapter 5M-1, F.A.C., are entitled to a presumption of compliance with state water quality standards per section 403.067(7)(c)3., F.S. FDACS is required to perform BMP Implementation Verification (IV) site visits to enrolled operations every two years to ensure that BMPs are being properly implemented. Details on IV site visits are provided herein. Enrollees participating in Equivalent Programs demonstrate compliance with

BMPs on the area(s) of the NOI property subject to the Equivalent Program instrument by fulfilling the requirements of Rule 5M-1.008(7), F.A.C.

Benefits of Implementing BMPs

FDACS works closely with the FDEP, WMDs, industry experts, and academic institutions to understand the environmental and agronomic effects addressed by BMPs. Benefits of enrolling in the FDACS BMP Program and implementing BMPs include:

- Reduction of agricultural production impacts on natural resources;
- Eligibility for cost share funding for certain BMPs (as funds are available);
- Availability of free services provided by the FDACS Mobile Irrigation Laboratories to evaluate irrigation system efficiency;
- Technical assistance with BMP implementation;
- Presumption of compliance with state water quality standards for the pollutants addressed by the BMPs;
- Release from the provisions of section 376.307(5), F.S., (fines for discharge damages) for pollutants addressed by the BMPs; and
- Avoidance of duplicative local regulation under section 163.3162, F.S.

In many cases, proper BMP implementation may also increase production efficiency, reduce operational costs, and support wildlife habitat.

Permit Exemptions

In most cases, FDACS BMPs do not replace or exempt agricultural operations from complying with applicable permitting or other regulatory requirements. If a permit is obtained, producers are still required to adopt and properly implement BMPs for the aspects of their operation not addressed by the permit.

Some agricultural activities, especially those that alter the hydrology of the land, may require an environmental resource permit (ERP). Check with the appropriate WMD or FDEP before beginning construction activities for a stormwater management system or other onsite activity resulting in hydrologic alteration to determine if an ERP is required, or whether the activities may be exempt from permitting requirements. The following are possible exemptions.

- Section 373.406(2), F.S., authorizes any person engaged in the occupation of agriculture to alter the topography of land for purposes consistent with normal and customary practices of agriculture for the area. These activities, however, may not be for the sole or predominant purpose of diverting or impeding surface waters, or adversely impacting wetlands. If a formal dispute between a landowner and a WMD arises regarding the applicability of a permit exemption, FDACS has exclusive authority to make a binding determination, should either party request it.
- Section 373.406(3), F.S., authorizes any person engaged in the occupation of agriculture to construct an agricultural closed system. This exception, however, is limited to the construction, operation, or maintenance of the agricultural closed system. Part II of Chapter 373, F.S., regarding the consumptive use of water remains applicable, which includes the taking and discharging of water for filling,

replenishing, and maintaining the water level in any such agricultural closed system.

- Section 373.406(6), F.S., exempts activities that will have only minimal or insignificant individual or cumulative adverse impacts on the water resources of the district as determined by FDEP or the WMD.
- Section 373.406(9), F.S., exempts environmental restoration activities on agricultural lands that have minimal or insignificant impacts to water resources from ERP permitting requirements. No activity may commence until the producer requests an exemption and the appropriate WMD or FDEP has provided written notice that the proposed activity qualifies for the exemption.
- Section 373.406(10), F.S., exempts interim measures or best management practices adopted pursuant to section 403.067, F.S., that are by rule designated as having minimal individual or cumulative adverse impacts to the water resources of the state.
- Section 373.406(13), F.S., exempts isolated man-made farm ponds up to 15 acres in size, constructed entirely in uplands, from ERP permitting requirements if the average depth of the pond is less than 15 feet and the pond is located at least 50 feet from a wetland.

Even if an exemption applies, agricultural producers located within an adopted BMAP area must either properly implement applicable BMPs or conduct water quality monitoring in accordance with section 403.067, F.S.

The Florida Right to Farm Act (section 823.14, F.S.) provides that a local government may not adopt any ordinance, regulation, rule, or policy to limit an activity of a *bona fide* farm operation on land classified as agricultural pursuant to section 193.461, F.S., whereon the activity is regulated through properly implemented BMPs or interim measures developed and adopted by FDEP, FDACS, or a WMD as part of a statewide or regional program. Not all activities conducted on a farm are addressed by adopted BMPs or interim measures, so this exemption may not apply to all activities.

BMP Implementation Verification

Florida law requires FDACS to conduct an IV site visit at least every two years to ensure that agricultural landowners and producers are properly implementing the applicable BMPs identified in their NOI. An IV site visit includes: review of nutrient records that producers must maintain to demonstrate compliance with the BMP Program; verification that all other applicable BMPs are being properly implemented; verification that cost share practices are being properly implemented; and identification of potential cost share practices, projects or other applicable BMPs not identified during enrollment. During the IV site visit, FDACS representatives also identify opportunities for achieving greater nutrient, irrigation, or water resource management efficiencies, including opportunities for water conservation.

FDACS must retain certain records pertaining to the application of nitrogen (N) and phosphorus (P) fertilizer from enrolled producers during IV site visits. OAWP adopted a Nutrient Application Record Form (NARF), (FDACS-04005, rev. 06/24, incorporated in Rule 5M-1.008(4), F.A.C.), to help simplify the record keeping requirements. The form is available from FDACS staff or from:

https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fforms.fdacs.gov%2F04005.xlsx&wdOrigin=BROWSELINK. References to Implementation Verification in this Manual apply to Equivalent Program enrollments only to the extent provided in Rule Chapter 5M-1, F.A.C.

Cost share

Enrollment in and proper implementation of BMPs makes a producer eligible for cost share for certain BMPs, other practices, and projects. The availability of cost share funds depends on annual appropriations by the Florida Legislature and, therefore, the amount available can vary each year. Cost share applications may be submitted once a producer has enrolled in the BMP Program and has been assigned a NOI number. Cost share practices are categorized as nutrient management, irrigation management, or water resource protection. BMPs, other practices, and projects eligible for cost share funding may include precision agriculture technologies, variable rate irrigation methods, water control structures, alternative watering systems, access control, cross-fencing, and tailwater recovery systems.

OAWP seeks to leverage its cost share funding with other cost share programs offered by FDACS and other state and federal agencies. The United States Department of Agriculture Natural Resources Conservation Service (NRCS) offers funding through its Environmental Quality Incentives Program, and certain WMDs also have agricultural cost share programs. Applicants are encouraged to use OAWP cost share in conjunction with these other available conservation programs although funding cannot be duplicative.

This, and other BMP manuals, can be accessed electronically at:
https://www.fdacs.gov/Agriculture-Industry/Water/Agricultural-Best-Management-Practices

Guide to Best Management Practice (BMP) Program Enrollment and Implementation

When enrolling, an FDACS OAWP representative will work with producers during an enrollment site visit.

Getting Started

1) **Request On-farm Technical Assistance.** Contact FDACS OAWP representatives for assistance with determining the BMPs that are applicable to the operation. For free assistance, call (863) 467-3250, email AgBmpHelp@FDACS.gov, or contact an FDACS OAWP office.

2) **Identify Applicable BMPs.** FDACS OAWP representatives will work with producers to identify all BMPs that are applicable to the operation and to document the BMPs on the NOI and BMP Checklist. The BMP Checklist will serve as the basis for subsequent implementation verification site visits to verify the proper implementation of the BMPs. If applicable, FDACS OAWP representatives will review other supporting materials such as an NRCS Comprehensive Nutrient Management Plan or FDEP approved Nutrient Management Plan for biosolids application.

   Enrollees under an Equivalent Program listed in Rule 5M-1.001(7), F.A.C., will complete, update, and submit their NOI in accordance with subsection Rule 5M-1.004(3), F.A.C.

3) **Submit an NOI.** FDACS OAWP representatives will assist producers in completing the NOI. Once the producer signs and submits the NOI with all the required information and the BMP Checklist, or documentation required of Equivalent Program Enrollees in accordance with Rule 5M-1.004(3), F.A.C., FDACS will review the information for completeness and enroll the Producer's operation in the BMP Program.

4) **Properly Implement the BMPs.** Producers must properly implement all applicable BMPs as soon as practicable, but no later than 18 months after completion and execution of the NOI and associated BMP Checklist.

   BMPs indicated as “Planned” in the BMP Checklist must include a completion date. Enter the completion date agreed to by the producer and FDACS OAWP representatives in the “Planned” box. Projects must be initiated as soon as the BMP is identified and cost share is available. The deadline for implementing BMPs that require cost sharing, engineering and design, permitting, or construction will be extended beyond 18 months, as needed.

   Proper implementation of the applicable nutrient management BMPs requires that producers demonstrate that N and P are applied at appropriate agronomic rates, when available. Producers should utilize the calculations and technical assistance tools to demonstrate that nutrient management practices are compatible with appropriate agronomic rates (see the Right Rate section below). The proper implementation of BMPs also requires ongoing record keeping and maintenance of BMPs (see the Record Keeping section below).

   For Enrollees under an Equivalent Program listed in Rule 5M-1.001(7), F.A.C., implementation verification shall be undertaken by the agency that issued the permit, license or other instrument, pursuant to its statutory and/or rule authority.

Preparing for a Site Assessment/Enrollment Visit

1) Review the BMP manual and note any question(s) regarding specific BMPs, unfamiliar terms, or content. Be ready to confirm the parcels of land to be enrolled in the BMP Program to ensure the accuracy of the information that will be submitted on the NOI.

2) During the site visit, the FDACS OAWP representatives will assist the producer with identifying potential pollutant sources and the most likely pathways to surface waters and groundwater. Representatives may ask to review previous soil tests, past fertilization practices, and other data to help with identification.

3) The FDACS OAWP representative will observe production-related activities near water resources such as wetlands, streams, sinkholes, springs, ponded or poorly drained areas, and any conveyances that discharge off site, and will discuss the BMPs that apply to these areas. Thinking ahead about the most efficient order in which to visit water resources on the site will improve the assessment and enrollment process.

The following web resources can be helpful for creating an inventory of the property's natural features, structures, and other improvements. The reference material listed below is for informational purposes and is not incorporated by reference.

- United States Department of Agriculture NRCS soil survey maps (http://websoilsurvey.nrcs.usda.gov/app/).
- United States Geological Survey topographic maps (https://www.usgs.gov/programs/national-geospatial-program/topographic-maps).
- National Wetlands Inventory (http://www.fws.gov/wetlands/).
- County Property Appraiser (http://floridarevenue.com/dor/property/appraisers.html).

Make sure that someone who is familiar with the nutrient and irrigation regimen of the operation is available on the day of the enrollment site visit.

Record Keeping

Enrollees who submit a Checklist must document the proper implementation of the applicable BMPs. Producers must keep records in accordance with Rule 5M-1.011, F.A.C., for BMPs noted with the pencil icon ( ) on the BMP Checklist. Examples of records to be kept include the rates and locations of all N and P applications and all soil test results. All BMP records should be accurate, clear, and well-organized. Record keeping examples are provided in Appendix 3 but are not adopted as a rule.

Enrolled producers must retain the applicable records for at least five years. Enrolled producers shall use the NARF, incorporated by reference in Rule 5M-1.008(4), F.A.C., or a substantially similar form that meets the criteria therein, to aggregate nutrient records. Enrolled producers are required to provide records regarding the application of N and P fertilizers on the enrolled property parcel to FDACS. The NARF will be collected and retained by FDACS during an implementation verification site visit every two years. Producers must maintain aggregate records in electronic or digital form unless justification is provided as to why the use of electronic or digital recordkeeping is not feasible. Although OAWP has developed a producer recordkeeping tool that may be used, it is not the only tool that can be used to meet this requirement.

All documentation required to verify the proper implementation of applicable BMPs is subject to inspection. Please note that falsification of records is a first-degree misdemeanor under Florida law.

In accordance with section 403.067(7)(c)6., F.S., agricultural records relating to processes or methods of production, costs of production, profits, other financial information, or N and P fertilizer application records collected by the Department during implementation verification are confidential and exempt from disclosure. Any such claim must be asserted at the time of submission by stamping the words “confidential and exempt information” on each page containing such information so the Department may handle them appropriately.

Best Management Practices (BMP) Checklist

BMP Checklist Instructions

With the exception of those enrolling under one of the Equivalent Programs listed in Rule 5M-1.001(7), F.A.C., producers must work with an FDACS representative to identify the applicable BMPs to be implemented on the subject parcel and to complete the BMP Checklist. Refer to the *Guide to BMP Program Enrollment and Implementation* section above. Failure to properly implement the applicable BMPs may subject your operation to compliance measures, including referral to FDEP for enforcement.

1) Check "In Use" for BMPs that are currently being implemented and can be observed on the operation at the time of enrollment or the IV site visit.

2) Check "Planned" for BMPs that will be implemented within a specific timeframe, but no later than 18 months after signing an NOI. **The producer understands that they are expected to implement this practice by the completion date entered into the "Planned" box. Projects must be initiated as soon as *the BMP is identified and* cost share becomes available. However, the deadline for implementing BMPs that require cost sharing, engineering and design, permitting, or construction will extend beyond 18 months as needed. Include practices that can't be observed at the time of site visit.**

3) Check "N/A" for BMPs that are not applicable to the operation. This status may be selected for individual BMPs or categories of BMPs where N and P are not applied in any form (Nutrient Management section), or where the operation does not include an irrigation system (Irrigation Management section). Producers are required to provide justification for any BMPs that are marked "N/A."

4) Enter the anticipated completion date for any planned practices (month and year) in the "Planned" box of the BMP Checklist during enrollment.

5) Producers must keep records of items indicated on the BMP Checklist. BMPs that require record keeping are noted by the pencil icon (). Enrolled producers are required to provide records upon request for review during a BMP implementation verification site visit. The NARF will be collected during the IV site visit by the FDACS representative.

6) After completion of all of the above steps, including the site visit and assessment, Producers are enrolled upon submitting to FDACS the NOI and the BMP Checklist. Producers enrolling under one of the Equivalent Programs are enrolled upon submitting to FDACS the NOI and documentation required of Equivalent Program Enrollees in accordance with Rule 5M-1.004(3), F.A.C. FDACS will provide written confirmation of enrollment. Keep a copy of each document.

7) Producers will work with the FDACS representative to modify the NOI or BMP Checklist, if needed, after initial enrollment. FDACS will provide written confirmation of any proposed changes.

Best Management Practices Checklist for Equine Operations

The producer agrees to perform the following items either checked as “In Use” or “Planned:

Nutrient Management					
Do you apply nitrogen (N) or phosphorus (P) or plan to apply N or P in any form on the operation associated with this NOI?			**Yes**	**No**	**-**
			In Use	**Planned**	**N/A**
1.1	**Right Source**				
	1	If using commercial fertilizer (including Class AA biosolids), identify and document the nitrogen (N) and phosphorus (P) concentrations using the guaranteed analysis or product label information prior to application.			
	2	If using Class A or Class B biosolids, follow the requirements of the FDEP permit.			
	3	If using reclaimed water and the supplier provides a nutrient content, adjust N and P fertilization rates as appropriate.			
1.2	**Right Rate**				
	1	Perform soil tests, tissue tests, or both to appropriately plan and manage fertilizer applications.			
	2	Use a soil extraction method listed in Appendix 2 appropriate for the soil type to perform soil test in 1.2.1. The use of other soil extraction methods must be approved by FDACS. Maintain documentation to justify using that method.			
	3	Regardless of which soil extraction method is used, base the P fertilization rate on recommended rates in the crop specific UF/IFAS publication(s), where available, or another credible source with scientific support (e.g., a calibrated crop response curve for the soil type and crop). Supplemental application may be justified based on current tissue testing results, soil variability, P availability, cultivar-specific requirements, or other substantiated production data that demonstrate crop need. Maintain documentation to support application amounts, particularly documentation used to justify application amounts above the recommended rates.			
	4	Base the N fertilization rate on recommended rates in the crop-specific UF/IFAS publication(s), where available, or another credible source with scientific support (e.g., a calibrated crop response curve for the soil type and crop). Supplemental application may be justified based on current tissue testing results, results from other technological testing methods, cultivar-specific requirements, or other substantiated production data that demonstrate crop need. Maintain documentation to support application amounts, particularly documentation used to justify application amounts above the recommended rates.			
	5	Record data, using the NARF or similar form, of all nutrient applications that contain N or P, including the date, and the N and P_2O_5 applied to each field or pasture.			
1.3	**Right Time**				

	1	Match plant growth stage N and P requirements and minimize N and P loss through leaching or runoff by using seasonal applications or split applications. If rainfall exceeds 3 inches in 3 days or 4 inches in 7 days, Producers may apply a single supplemental application of N (up to 30 pounds per acre). This supplemental application must occur as soon as practicable following the event but cannot occur within 10 days of the next regularly scheduled application of N. Producers must keep copies of all application records as well as rainfall data and any other records used to justify the supplemental N application			
1.4	**Right Place**				
	1	Ensure all fertilizer application equipment is calibrated according to the manufacturer's specifications for the type of fertilizer used.			
	2	Prevent application of fertilizer or other nutrient sources directly to surface waters and sinkholes.			
1.5	**Fertilizer Storage and Handling**				
	1	Store fertilizer material (defined as all composted animal waste, biosolids, and/or commercial N or P sources) under a waterproof cover unless used or applied as soon as practicable after delivery.			
	2	Load fertilizer at a location and in a manner that prevents adverse effects on surface waters or sinkholes.			
1.6	**Additional Nutrient Management BMPs for Equine Operations – Manure Management**				
	1	If the operation applies manures, poultry litter, compost, or other substances generated off-site that contain N or P to promote plant growth, determine and document the N and P concentrations of the materials prior to application per NARF requirements.			
	2	Manure collected from confined areas (e.g., small paddocks, stalls and feeding areas) that is not removed from the premises must be stored on an impervious surface or covered with a tarp or other waterproof material to prevent leaching or handled according to a manure management plan. Prevent spreading manure near surface waters, drinking water wells, sinkholes or property boundaries.			
	3	Compost manure to kill pathogens, reduce pests, and increase the value of manure.			
	4	When composting, use the appropriate on-site composting system (free-standing pile, windrow, or bin system), based upon the amount of manure generated on-site.			
	5	Locate manure storage areas to ensure that there is no discharge into surface waters, drinking water wells, sinkholes, or property boundaries. Possible measures include distance setbacks (Appendix 4) and/or constructing an impervious base (concrete or compacted clay), using a berm upgradient of the manure pile, and/or covering with a tarp or other waterproof material.			
	6	If using a commercial hauler to transport manure material off site, maintain records (e.g., bill of lading) to document that the manure has been transported off site.			
Irrigation Management					

Do you have an irrigation system or plan to install an irrigation system associated with this NOI?			**Yes**	**No**	**-**
	If you answered "Yes" to the previous question, is the system pressurized?		**Yes**	**No**	**-**
			In Use	**Planned**	**N/A**
2.1	**Crop Water Requirements and Irrigation Scheduling**				
	1	Manage irrigation based on electronic soil moisture sensors equipped with electrical capacitance probes. If electronic soil moisture sensors are not used, follow practices 2.1.2 or 2.1.3 below.			
	2	Maintain the water table (saturated zone) at a level in proximity to plant rooting depths when using seepage irrigation.			
	3	Use decision support tools and information to plan irrigation events and describe these tools in the Comments line below. Tools may include weather stations, rain gauges, or others.			
COMMENTS					
2.2	**Irrigation System Maintenance and Evaluation**				
	1	Contact a Mobile Irrigation Laboratory (MIL) or other qualified analyst approved in writing by FDACS to schedule an irrigation efficiency evaluation of your pressurized irrigation system at least every five years.			
	**2**	Keep records of MIL evaluations, major maintenance and repairs, and system changes made to comply with MIL recommendations			
	3	Establish minimum efficiencies and timeframes for repair and recheck, depending on system.			
	4	Clean and maintain filtration equipment so that it operates within the recommended pressure range.			
	5	Inspect sprinkler nozzles or emitters annually for wear and malfunction and replace as necessary.			
	6	Flush and treat irrigation lines regularly to prevent clogging.			
	7	Ensure that flow meters are properly calibrated and correctly measuring water usage, or use other acceptable methodologies.			
Water Resource Protection					
			In Use	**Planned**	**N/A**
3.1	**Stream and River Protection**				
	1	On fields adjacent to perennial streams or rivers, or regional canal systems flowing through the enrolled property, use riparian buffers, field borders, filter strips, or non-fertilized vegetated filter strips that are not less than 25 feet wide.			
	2	Maintain the above riparian buffers, field borders, filter strips, or non-fertilized vegetated filter strips to ensure those features function as designed.			

	3	Revegetate bare areas in the above riparian buffers, field borders, filter strips, or non-fertilized vegetated filter strips if the bare areas reduce the function of the buffer.			
	4	Install and maintain temporary fencing or other access control along areas adjacent to perennial streams when stream banks have significant (more than 20 percent) rill or gully erosion resulting from the operation. Temporary access control is appropriate for grow-in of riparian buffer installation or repairs.			
3.2	**Springs and Sinkholes**				
	1	Buffer springs and spring runs with a minimum of 100 feet of non-fertilized vegetation.			
	2	Buffer sinkholes and other visible karst features with a minimum of 50 feet of non-fertilized vegetation.			
	3	Never dispose of any materials into sinkholes.			
	4	In Outstanding Florida Springs BMAPs adopted by FDEP, do not exceed appropriate fertilizer rates for N, based on crop nutrient requirements as described in practice 1.2.4. above.			
	5	Within Outstanding Florida Springs BMAPs, manure storage areas located in a karst area must be covered with a tarp or other waterproof material to prevent leaching.			
3.3	**Wetlands and Lakes**				
	1	Buffer wetlands with a minimum of 25 feet of non-fertilized vegetation or consistent with ERP buffers when they are established by permit.			
	2	Buffer impaired waterbodies located within adopted BMAP areas with a minimum of 50 feet of non-fertilized vegetation or consistent with ERP buffers when they are established by permit.			
	3	If fencing through wetlands, keep cleared areas for fencing no wider than 25 feet.			
	4	Remove horses from flooded areas until flooding subsides, when practical.			
3.4	**Ditch Maintenance and Water Management**				
	1	Maintain perennial herbaceous vegetation on all ditch and canal banks to protect them from erosion or provide an alternative means for preventing sediment from moving off site.			
	2	When sediments are observed in runoff moving off site, work with FDACS to evaluate the feasibility of implementing appropriate settling measures.			
	3	Operate and maintain water control structures to minimize the movement of N, P, and sediment off site.			
	4	Operate and maintain water control structures to minimize the admission of aquatic vegetation into downstream public waterways.			
	5	Do not remove sediments below the ditch's original invert elevation unless installation or maintenance of sumps or sediment traps is required. Original invert elevations can be determined by engineering drawings or changes in soil characteristics and color.			

	6	Ensure that pump intakes are sufficiently elevated from the bottom of water conveyances, or consistent with an ERP to reduce sediment and debris in offsite discharges.			
	7	Install gutters and downspouts on all buildings adjacent to HIAs and divert this water away from the HIA toward pastures or other vegetated areas.			
	8	Use spreader swales (or other means as needed) to intercept water discharging from the ditch(es), in order to reduce flow velocities and provide sheetflow through vegetative buffers prior to reaching the wetlands.			
COMMENTS					
3.5	**Erosion Control**				
	1	Construct and maintain above-grade access roads so that they minimize the impeding or diversion of surface water flow.			
	2	Maintain vegetative cover or alternative means for stabilizing road banks to prevent sediments from moving off site. Describe the alternative means in the Comments section.			
	3	Locate and size permanent crossing areas over surface waters to minimize adverse effects to water resources.			
	4	Stabilize all crossings over streams and creeks using rocks, culverts, bridges, or other methods to prevent erosion.			
3.6	**Wellhead Protection**				
	1	Inspect wellheads and pads for significant leaks or cracks and make any necessary repairs.			
	2	Prevent contamination by using backflow prevention devices at wellheads if injecting fertilizer or chemicals, or if shared with a potable use source.			
	3	Cap or valve any existing flowing wells.			
	4	Retrofit existing wells with a concrete collar or fence where necessary to protect them from livestock.			
3.7	**Non-Fertilizer Material Storage and Handling**				
	1	Store pesticides separate from fertilizers in an enclosed, roofed structure with an impervious floor and lockable door, at least 100 feet away from wells, surface waters, or sinkholes.			
	2	Mix and load pesticides on an impermeable surface, use portable mix/load stations, or conduct any field mix/load activities at random locations in the field.			
	3	Recycle or properly dispose of used oil, solvent bath waste, and antifreeze in accordance with state and federal laws.			
COMMENTS					
3.8	**Additional Water Resource Protection BMPs for Equine Operations**				
	1	Locate and maintain watering troughs, and supplemental feeding and mineral stations at least 100 feet away from surface waters and sinkholes as practicable for the operation.			
	2	Direct runoff from all HIAs away from surface waters, wells, or sinkholes using filter strips, buffers, berms, grassed waterways, or swales.			

	3	Locate all HIAs as far from surface waters, sinkholes, or wells as practicable for the operation. HIAs must be 200 feet from these resources, unless pre-existing at the time of enrollment.			
	4	Incorporate cross-fencing to subdivide larger pastures and implement rotational grazing, where appropriate. If installing fences in wetlands, follow the criteria in BMP 3.3.3.			
	5	Avoid overgrazing by considering the grazing height information in Table 2 to ensure that pastures are not denuded and have adequate residue for regrowth			
	6	Utilize grazing schedules using NRCS Conservation Practice Standard (CPS) Prescribed Grazing (Code 528) for guidance.			
	7	Drag pastures, as needed, to distribute manure evenly across the pasture.			
	8	Spread manure at appropriate rates using a spreader designed for pasture application of manure.			
	9	Whether permanent or temporary washing areas are used, locate them at least 50 feet away from surface waters, wells, and domestic septic tank drainfields. Direct runoff to a well-vegetated area.			
	10	For below-ground burial, locate any burial site at least 100 feet from adjacent property and at least 200 feet from surface waters, wells, or sinkholes.			
	11	Dispose of spent needles and unused pharmaceutical products by using an approved biomedical container, or by following other guidance approved by the EPA.			

PART B

Best Management Practices for Equine Operations

The purpose of the narrative set forth below is to provide information for producers to consider while implementing the BMPs established in their BMP Checklist and to assist in planning, development, and production efforts for their operation. The contents of the narrative shall not be interpreted or construed as creating additional obligations or requirements that exceed the BMPs detailed in the BMP Checklist. The reference materials cited in the narrative have been utilized for technical and scientific support for the manual but are not incorporated by reference herein.

In implementing BMPs, it is recognized that each producer's operation is unique and individual. The information set forth in the manual is not exhaustive and does not address or identify all the factors that may affect production practices and land management for equine operations. Producers may determine that it may be necessary to add practices to the BMP Checklist to fit specific production unit needs. In doing so, the producer may consult the BMP manual and other publications and information as part of the analysis of the site's individual characteristics, historical uses, economic and technical considerations, market factors, and changes in production.

1.0 Nutrient Management

Beneficial nutrient management decisions for pastures and forages are based on consideration of nutrient inputs including commercial fertilizers, organic materials like manure, compost and biosolids, supplemental mineral and feed, and any irrigation water used (especially reclaimed water). Producers are encouraged to develop a nutrient management plan for their operation to reduce potential effects on water resources.

4Rs of Nutrient Management

The scientific principles of the 4R nutrient stewardship framework involve applying the ***Right Source*** of fertilizer at the ***Right Rate,*** at the ***Right Time,*** and in the ***Right Place.*** The effective application of the 4R framework depends on site-specific characteristics such as soil type, cropping system, management techniques, and weather. The 4R nutrient stewardship provides a framework to achieve cropping system goals, such as increased production, increased farmer profitability, enhanced environmental protection and improved sustainability. The 4R nutrient stewardship framework requires the implementation of BMPs that optimize the efficiency of fertilizer use. The goal is to match nutrient supply with crop requirements and to minimize nutrient losses from fields while taking into consideration local soil and climatic conditions, crop, management conditions and other site-specific factors.

Other agronomic and conservation practices such as no-till farming and the use of cover crops play a valuable role in supporting 4R nutrient stewardship. As a result, fertilizer BMPs are most effective when applied with other agronomic and conservation practices.

1.1 Right Source: Nutrient Composition and Bioavailability

	**Right Source 1.1.1.**	If using commercial fertilizer (including Class AA biosolids), identify and document the nitrogen (N) and phosphorus (P) concentrations using the guaranteed analysis or product label information prior to application.

Guidance: The right source involves ensuring an adequate supply of nutrients in plant-available forms by using the right product based on forage needs. Nutrients may already be

available in the soil (e.g., if cover crops were planted) but soil properties may interact with certain fertilizer sources to affect nutrient availability. Commercial nutrient sources include liquid, dry, solution, and enhanced efficiency fertilizers (EEF). Conventional fertilizers are usually formulated as water soluble products. An EEF is a blanket term for fertilizers with characteristics that allow for increased plant uptake while reducing the potential for nutrient losses to the environment compared to soluble fertilizers. EEFs may be slow release such as sulfur-coated urea, animal manures, and biosolids; controlled release, such as polymer-coated urea; or stabilized N sources such as urease and nitrification inhibitors.

	**Right Source 1.1.2.**	If using Class A or Class B biosolids, follow the requirements of the FDEP permit.

Guidance: Biosolids are sometimes used to beneficially recycle nutrients that may otherwise go to waste. Biosolids mineralize nutrients slowly over time and may provide value for soil health in mineral soils due to the organic matter content. If using biosolids, the nutrient and pH analysis must be obtained from the wastewater treatment plant or permitted hauler before application. Application of class AA biosolids, which are regulated as fertilizer and are labeled with a guaranteed analysis, are addressed in BMP 1.1.1. Producers must consider the N to P ratio when applying biosolids at recommended agronomic rates to avoid over-application of P.

Any land on which Class A or Class B biosolids are applied must meet FDEP requirements contained in Rule Chapter 62-640, F.A.C. Biosolids must be applied at the proper agronomic rate, as required in the FDEP permit, with consideration of both plant-available N and P. The appropriate application rate must be based on actual production and the specific plant species and utilization.

	**Right Source 1.1.3**	If using reclaimed water and the supplier provides a nutrient content, adjust N and P fertilization rates as appropriate.

Guidance: Equine producers using reclaimed water on their operations may obtain copies of the wastewater treatment facility's permit, which outlines the authorized range of nutrients allowed in the final effluent and use this information to adjust fertilization rates.

1.2 Right Rate: Calculating application rates using soil and tissue testing

	**Right Rate 1.2.1.**	Perform soil tests, tissue tests, or both to appropriately plan and manage fertilizer applications.

Guidance: Appropriate rates of N or P application for forage crops are determined using recommended rates in the crop-specific UF/IFAS publication(s), where available, or based on another credible source with scientific support (e.g., a calibrated crop response curve for the soil type and crop) and accounting for soil test results prior to planting. Additional N and P may be justified during the growing cycle based on plant tissue testing results. Soil testing provides pH

values, indices of P, potassium, calcium, and magnesium, micronutrients available in the soil, and nutrient rate recommendations for forage crop needs. Nitrogen is not analyzed in soil tests in Florida because it changes forms and is highly mobile. Instead, recommended N application rates are based on many years of crop research. A soil test that is less than one year old is required and must demonstrate a need for P prior to any application of P. If not applying P, it is still good practice to conduct soil tests every three to five years on established pastures to gauge changes that may occur over time, especially changes in soil pH.

Soil pH is one of the most important properties that affect nutrient availability to the plant and soil microbial activity. Soil pH can be increased by adding lime or dolomite, or lowered by adding acidifying materials like elemental sulfur or ammonium fertilizer. The pH of irrigation water should also be considered as it can affect soil pH over the long term. Producers can use soil test results to manage soil pH to improve uptake of N and P. Consider crop nutrient requirements and other current conditions before adding amendments to adjust soil pH.

Equine producers must use soil tests, tissue tests, or both to determine the appropriate UF/IFAS fertilizer recommendations for Bahiagrass or another source based on a calibrated crop response for the soil type and crop. Crop requirements may be adjusted based on site-specific challenges, tissue testing results, soil variability, historical factors, P availability, or cultivar-specific requirements. Follow the UF/IFAS fertilizer rates or another calibrated crop response source for most forage crops found in UF/IFAS Fact Sheet SL-129, Standardized Fertilization Recommendations for Agronomic Crops, available at: http://edis.ifas.ufl.edu/SS163

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	**Right Rate 1.2.2.**	Use a soil extraction method listed in Appendix 2 appropriate for the soil type to perform soil test in 1.2.1. The use of other soil extraction methods must be approved by FDACS. Maintain documentation to justify using that method.

Guidance: When submitting soil samples, request the appropriate soil test extraction method based on soil type (see Appendix 2). If a method other than those set forth in Appendix 2 is requested, be prepared to provide justification for the method used. Follow the fertilization rates in UF/IFAS Publications applicable to the crops you are producing, where available, or another credible source with scientific support such as a calibrated crop response curve for the soil type and crop. Retain all documentation used.

	**Right Rate 1.2.3.**	Regardless of which soil extraction method is used, base the P fertilization rate on recommended rates in the crop-specific UF/IFAS publication(s), where available, or another credible source with scientific support (e.g., a calibrated crop response curve for the soil type and crop). Supplemental application may be justified based on current tissue testing results, soil variability, P availability, or cultivar-specific requirements, or other substantiated production data that demonstrate crop need. Maintain documentation to support application amounts, particularly documentation used to justify application amounts above the recommended rates.

Guidance: Many of Florida's soils may contain adequate amounts of P, assuming the soil pH is within the correct range to make it available to plants. Managing pH may be impracticable for some forage types. Further, pH may not be the best indicator of P availability in organic and mineral soils in Florida. Applying P in starter fertilizer is warranted. Otherwise, supplemental P is only applied when supported by a calibrated soil test or by tissue testing results or when substantiated production data such as yield, delayed harvest conditions, or marketable crop quality, demonstrate the need for supplemental P.

	**Right Rate 1.2.4.**	Base the N fertilization rate on recommended rates in the crop-specific UF/IFAS publication(s), where available, or another credible source with scientific support (e.g., a calibrated crop response curve for the soil type and crop). Supplemental application may be justified based on current tissue testing results, results from other technological testing methods, cultivar-specific requirements, or other substantiated production data that demonstrate crop need. Maintain documentation to support application amounts, particularly documentation used to justify application amounts above the recommended rates.

Guidance: Proper fertilization for forage production reflects the need for grass growth and re-growth following establishment or grazing. Nitrogen is the most important nutrient for this response. Generally, higher rates and frequencies of N application reduce the production time for a crop; however, excessive N rates increase top growth at the expense of the roots. Any N or P application exceeding plant nutrient uptake needs can cause these nutrients to leach or runoff and contribute to eutrophication of receiving waters.

	**Right Rate 1.2.5.**	Record data, using the NARF or similar form, of all nutrient applications that contain N or P, including the date, and total N and P_2O_5 applied to each field or pasture.

Guidance: Producers must have all required nutrient records ready for FDACS representatives to inspect. The FDACS representative will retain the NARF pertaining to N and P application. When IV site visits are conducted every two years, producers are required to have the following nutrient records ready for inspection to ensure compliance with BMPs:

- Soil and tissue test results as required for each pasture being fertilized which clearly indicate the forage crop being grown.
- Justification for using the selected soil test method.
- Area fertilized in acres for each pasture.
- Amount of fertilizer applied to each pasture in gallons if using liquid fertilizer or in pounds if using dry fertilizer.
- Fertilizer receipts with formulation, and the density of liquid fertilizer if used.

1.3 Right Time: Timing of fertilizer application

Right Time 1.3.1.	Match plant growth stage N and P requirements and minimize N and P loss through leaching or runoff by using seasonal applications or split applications. If rainfall exceeds 3 inches in 3 days or 4 inches in 7 days, Producers may apply a single supplemental application of N (up to 30 pounds per acre). This supplemental application must occur as soon as practicable following the event but cannot occur within 10 days of the next regularly scheduled application of N. Producers must keep copies of all application records as well as rainfall data and any other records used to justify the supplemental N application.

Guidance: Schedule fertilizer applications based on the dynamics of forage growth and nutrient demand during the growing season, nutrient loss risks, and field operations. Forecasted rain, potentially leaching rain events (when rainfall exceeds 3 inches in 3 days or 4 inches in 7 days) and other weather events must be considered before applying N or P to pastures. Avoid applying fertilizer in the days preceding forecasted, potentially leaching rain events or when soils are saturated. Supplemental application of N following a leaching rain event should not be considered a standard practice. Producers should carefully evaluate previous and planned applications of N and their specific situation to determine whether supplemental N is needed following a potentially leaching rain event.

Splitting nutrients into several, smaller applications can help maintain available nutrients to the crop for longer periods of time and minimize leaching or runoff following rain events. The use of EEFs or organic soil amendments that depend on biological processes to release nutrients also reduces risks to water quality when properly managed. The use of EEF sources also influences the timing of fertilization, in that fertilization is required less frequently.

One of the most important principles of fertilizer timing is to avoid fertilizer application to dormant or non-growing pastures. During dormancy, such as winter conditions for warm-weather forage or crops, when plant growth slows, plants take up little to no nutrients, so any applied N or P is more likely to leach or run off.

1.4 Right Place: Fertilizer application and equipment calibration

	**Right Place 1.4.1.**	Ensure all fertilizer application equipment is calibrated according to the manufacturer's specifications for the type of fertilizer used.

Guidance: Regular equipment calibration helps ensure proper fertilizer placement. Calibration methods vary based on the type of fertilizer and fertilizer application equipment used. For granular materials, it may be necessary to recalibrate equipment whenever using a new material that has different particle density, size, or flow characteristics. Calibrate equipment according to the manufacturer's recommendations and whenever wear or damage is suspected to have altered the delivery rate or pattern. When using a spreading service, ensure that the service provider has calibrated the equipment for your site specifications.

Right Place 1.4.2	Prevent application of fertilizer or other nutrient sources directly to surface waters and sinkholes.

Guidance: Target nutrient applications in or very near the root zone to maximize plant uptake and limit potential losses from pastures. Reduce fertilizer applications in areas where grazing animals congregate, and do not apply fertilizer to pasture swales and V-ditches that have standing water. Producers must not apply nutrient sources directly to surface water resources and must observe the applicable setbacks established in the manual. Consult your FDACS representative to identify those water resources and associated areas where the application should not occur.

Many producers use precision agriculture tools, such as global positioning systems (GPS) and associated navigation instruments (e.g., light-bar system) to guide field application equipment more precisely. Fertilizers can be applied at variable rates throughout a pasture for more efficient application to reduce water quality effects and provide cost savings.

1.5 Fertilizer Storage and Handling

Fertilizer Storage and Handling 1.5.1.	Store fertilizer material (defined as composted animal waste, biosolids, and/or commercial N or P sources) under a waterproof cover unless used or applied as soon as practicable after delivery.

Guidance: Fertilizer material (defined as all composted animal waste, biosolids, and/or commercial N or P sources) can be a significant source of water pollution if not properly handled. Protect fertilizer material from rainfall and other risks of nutrient leaching by covering with impervious material or storing under a roof unless justification is provided (such as soil sampling or monitoring) to demonstrate that existing storage will not result in nutrient leaching to water resources. Fertilizer material should be stored on an impervious surface unless it is demonstrated to be adequately protected from rainfall and water flowing across the property. Nitrogen-based fertilizer material must always be stored separately from solvents, fuels, and pesticides since many fertilizers are oxidants and can accelerate a fire. When feasible, it is advisable to order and stock only as much dry fertilizer material as needed per application.

Fertilizer Storage and Handling 1.5.2.	Load fertilizer at a location and in a manner that prevents adverse effects on surface waters or sinkholes.

Guidance: Load fertilizer into application equipment away from wells or waterbodies to prevent possible runoff and water quality effects. Loading over a concrete or asphalt pad with rainfall protection is the preferred practice and makes it easier to recover any spilled material. If this is not feasible, load at random locations in the field to prevent a buildup of any spilled nutrients in one location. Clean up spilled material immediately. Collected material may be applied as fertilizer.

1.6 Additional Nutrient Management BMPs for Equine Operations

	**Manure Management 1.6.1.**	If the operation applies manures, compost, or other substances generated off-site that contain N or P to promote plant growth, determine and document the N and P concentrations of the materials prior to application per NARF requirements.
	1.6.2.	Manure collected from confined areas (e.g., small paddocks, stalls and feeding areas) that is not removed from the premises must be stored on an impervious surface or covered with a tarp or other waterproof material to prevent leaching or handled according to a manure management plan. Prevent spreading manure near surface waters, drinking water wells, sinkholes or property boundaries.
	1.6.3.	Compost manure to kill pathogens, reduce pests, and increase the value of manure.
	1.6.4.	When composting, use the appropriate on-site composting system (free-standing pile, windrow, or bin system), based upon the amount of manure generated on-site.
	1.6.5.	Locate manure storage areas to ensure that there is no discharge from them into surface waters, drinking water wells, sinkholes, or property boundaries. Possible measures include distance setbacks (Appendix 4) and/or constructing an impervious base (concrete or compacted clay), using a berm upgradient of the manure pile, and/or covering with a tarp or other waterproof material.
	**1.6.6.**	If using a commercial hauler to transport manure material off site, maintain records (e.g., bill of lading) to document that the manure has been transported off site.

Guidance: Remove manure build-up from areas around permanent feed and water stations on a regular basis. These areas should be minimized as much as possible, as some leaching occurs even though the manure is removed on a regular basis. Stabilizing these areas can help reduce mud and prevent erosion. Locate manure storage facilities where there is minimal runoff potential to reduce the risk of surface water contamination. Appendix 4 provides a reference table of setback distances for manure storage areas. Do not locate manure storage facilities in depressional areas, where water tends to pool, because of the potential to contaminate ground water. The manure storage facility should be convenient to barns and other areas where horses are housed and manure is generated, but not too close in case of a fire. Manure storage areas should be on an impervious surface and/or covered with a tarp to prevent leaching. Manure cannot be piled up for a long duration and will need to be disposed of properly in accordance with an established plan. If land-applying the manure, keep application away from surface waters, drinking water wells, sinkholes, or property boundaries and setback distances. If possible, locate manure storage facilities out of sight of public places and neighboring residences.

Portable shade and feed structures can be moved frequently to reduce the impact of HIAs. If supplemental feed is needed, use feed in areas away from wetlands and other waterbodies to reduce the potential to impact surface waters. Consider the location of the water source in relation to the shade and feed structures.

With a little extra effort, farmers can create valuable compost from manure and bedding. Composting is a method of managing livestock manure to accelerate its decomposition. During

the composting process, microorganisms break down manure and bedding into a nutrient-rich material that resembles soil. The goal of composting is to provide the ideal environment and the proper balance of nutrients needed by the microorganisms to encourage a rapid rate of decomposition of the manure. Key considerations affecting the rate of decomposition are moisture content and the carbon-to-nitrogen (C:N) ratio.

When done properly, composting kills the parasite eggs, insect larvae, and pathogens found in livestock manure. Composting reduces manure odor and can decrease the size of a manure stockpile by as much as 50 percent. Finished compost can be used as slow-release fertilizer, as mulch, or as a growing medium for plants, mushrooms, and worm farms. When properly applied to pastures and other areas during the growing season, compost can also help reduce the use of commercial fertilizer, thereby saving money.

The moisture content of the composting material should be maintained at approximately 50% for the growth of microorganisms in the compost. During the composting process, heat will be generated. This will result in a loss of moisture from the compost, so water may need to be added periodically. When composting, aerate materials adequately (through turning or via passive aeration systems) and monitor internal temperature.

In general, a high C:N ratio immobilizes N, while a low C:N ratio results in a rapid release of N. A high proportion of carbon (C:N ratio greater than 30:1) can immobilize or tie up N in the material/compost pile and may even immobilize available N in the soil if the material is land-applied prematurely. **Table 1** below presents carbon and N concentrations and ratios found in typical compost materials.

Table 1. Carbon-to-Nitrogen Ratios for Typical Compost Materials.

Material	% Carbon	% Nitrogen	C:N Ratio
Blood meal	43	13.0	3.3:1
Cottonseed meal	42	6.0	7:1
Legume hay, dry	40	2.0-2.5	20:1
Grass hay, dry	40	1.0-1.5	40:1
Fresh manure, cow	20-30	0.6-1.0	20-30:1
Fresh manure, horse	20-35	0.5-1.0	20-70:1
Fresh manure, laying chickens	11-20	1.5-3.0	3-15:1
Fresh manure, broiler chickens	20-33	1.3-2.0	15:1
Wheat or oat straw, dry	48	0.5	96:1
Grass clippings, fresh	10-15	1-2	7-15:1
Peanut hulls, dry	50-60	1-2	40-50:1
Fallen leaves	20-35	0.4-1.0	20-75:1
Newspaper or cardboard, dry	40	0.1	400:1
Wood chips, shavings or sawdust	25-50	0.1	250-500:1

2.0 Irrigation Management

Water management and nutrient loading to surface and groundwater are linked and, therefore, good irrigation management involves properly planning for water supply needs for crops to support equine operations, maintaining irrigation systems to ensure optimal performance, and protecting wellhead areas to prevent contamination of the water supply. Contact the appropriate WMD to determine whether a consumptive use or water use permit is required.

2.1 Forage Water Requirements and Irrigation Scheduling

Forage Water Requirements and Irrigation Scheduling 2.1.1.	Manage irrigation based on electronic soil moisture sensors equipped with electrical capacitance probes. If electronic soil moisture sensors are not used, follow practices 2.1.2 or 2.1.3 below.

Guidance: Soil moisture sensors are one of the best irrigation management tools available. These sensors can be equipped with probes that measure the electrical capacitance of the soil column and aid producers with managing the soil water content to meet production requirements. While soil plasticity has been used historically as an estimation of when to irrigate, such "feel tests" require training and experience and the interpretation is not as accurate or precise as using calibrated and maintained soil moisture sensors.

Forage Water Requirements and Irrigation Scheduling 2.1.2.	Maintain the water table (saturated zone) at a level in proximity to plant rooting depths when using seepage irrigation.

Guidance: Subsurface (seepage) irrigation involves raising the water table to a desired level by pumping water into ditches or canals and using water control structures to manipulate the water table and reduce the volume of discharge and sediments. Proper design is needed for an effective and efficient system. Ongoing maintenance is also needed to ensure that ditches and water control structures continue to function as designed. Cost share may be available to those producers that require additional water management practices as an applicable BMP to improve seepage irrigation efficiency and reduce discharges. A water table observation well is an inexpensive management tool used in some parts of Florida that provides a visual indication of surficial (near to the surface) groundwater levels.

Forage Water Requirements and Irrigation Scheduling 2.1.3.	Use decision support tools and information to plan irrigation events and describe these tools in the Comments line [on the BMP Checklist]. Tools may include weather stations, rain gauges, or others.

Guidance: Evapotranspiration (ET) and other climatic factors affect plant irrigation requirements. Forages may require different levels of irrigation depending on their growth stage and corresponding ET rates. Specific ET rates can be obtained for your growing area from the UF/IFAS Florida Automated Weather Network (FAWN) or by using other weather station data. FAWN stations also measure air temperature, soil temperature, wind speed and direction, rainfall, relative humidity, and solar radiation. This information is available at: http://fawn.ifas.ufl.edu. Rainfall can also be easily monitored using rain gauges.

Irrigation scheduling consists of determining the correct timing, duration, and frequency of irrigation and is based on factors such as soil water-holding capacity, potential ET rates, and total and projected rainfall. Irrigation system water loss rates are affected by sunlight, wind speed, relative humidity, and air temperatures. Water loss can be reduced by irrigating when conditions do not favor excessive evaporation, especially when overhead irrigation systems are used. When possible, irrigate in the early morning hours before air temperatures rise and relative humidity drops. This allows sufficient time for infiltration into the soil and for the plant canopy to dry, thereby reducing evaporative losses and disease development. Apply only enough water to wet the entire root zone without leaching water, N, and P.

2.2 Irrigation System Maintenance and Evaluation

Irrigation System, Maintenance, and Evaluation	**2.2.1.**	Contact a Mobile Irrigation Laboratory (MIL) or other qualified analyst approved in writing by FDACS to schedule an irrigation efficiency evaluation of your pressurized irrigation system at least every five years.
	**2.2.2.**	Keep records of MIL evaluations, major maintenance and repairs, and system changes made to comply with MIL recommendations.
	2.2.2.	Establish minimum efficiencies and timeframes for repair and recheck, depending on system.
	2.2.4.	Clean and maintain filtration equipment so that it operates within the recommended pressure range.
	2.2.5.	Inspect sprinkler nozzles or emitters annually for wear and malfunction and replace as necessary.
	2.2.6.	Flush and treat irrigation lines regularly to prevent clogging.
	2.2.7.	Ensure that flow meters are properly calibrated and correctly measuring water usage, or use other acceptable methodologies.

Guidance: The uniformity of water application and efficiency of an irrigation system tend to decrease over time because of aging, weathering, clogging, and component breakdown unless proper system maintenance is performed. Therefore, the irrigation system itself should be well maintained and operated at the highest irrigation efficiency and uniformity that is practicable.

Maintenance programs for pressurized irrigation systems generally involve filtration, chlorination/acidification, flushing, repair or replacement of clogged nozzles, and observation of performance. Irrigation systems that are well maintained help ensure uniform crop growth, conserve water, and reduce operation and maintenance costs.

Center-pivot systems typically have an end gun to reach the corner target areas of a field and are most efficient when equipped with an end gun shutoff to prevent water from being applied outside

the target areas. Consider soil type, soil slope, source water quality, and water requirements when selecting a sprinkler package for one of these systems.

The most common sprinklers used on new systems are reduced-angle impact sprinklers (usually 6 degrees), low-pressure sprinklers on top of the irrigation boom, and low-energy precision drop nozzles. Each of these options uses less water than high-angle impact sprinklers, which are typically mounted on the top of the irrigation boom. Additional water conservation efficiencies can be achieved by removing non–crop areas from irrigation, matching application amounts with variations in soil type and field topography, and eliminating duplicative application due to pivot overlap. Variable rate irrigation technology includes speed control, zone control, or both, and is particularly well suited to center pivot irrigation systems and often results in reduced water use.

Even the best designed, most efficient irrigation system, whether overhead or seepage, will perform poorly if its components are not properly maintained. Depending upon the extent of irrigation, mobile irrigation laboratories (MILs) will help equine producers evaluate their system's irrigation uniformity and identify maintenance needs, free of charge. A pressurized system evaluation is required every five years. Equine operations with irrigation systems should also develop and follow an irrigation maintenance program that includes periodic calibration of water meter(s), and visual inspections to identify any necessary repairs or corrective actions. Producers are encouraged to keep records of all inspection and maintenance activities.

3.0 Water Resource Protection

The following section describes several types of waterbodies and methods for protecting them from potential water quality effects.

3.1 Stream and River Protection

Stream and River Protection 3.1.1.	On fields adjacent to perennial streams, rivers, or regional canal systems flowing through the enrolled property, use riparian buffers, field borders, filter strips, or non-fertilized vegetated filter strips that are not less than 25 feet wide.
3.1.2.	Maintain the above riparian buffers, field borders, filter strips, or non-fertilized vegetated filter strips to ensure those features function as designed.

Guidance: One of the most effective ways to prevent P, N, sediments, and pollutants from entering streams and rivers is establishing non-fertilized vegetative buffers. Vegetative buffers are non-cultivated areas that retain water and soil onsite to help reduce pollutants in surface water runoff. Vegetative buffers may include riparian buffers, field borders, filter strips, and grassed waterways, and are particularly effective in providing water quality treatment near sensitive discharge areas. Field borders are strips of either natural or planted permanent vegetation at the edge or perimeter of fields. Field borders help reduce erosion from wind and water, protect soil structure and water quality, and provide wildlife habitat. Filter strips and grassed waterways are areas of permanent vegetation between production areas that drain to natural waterbodies, decreasing runoff velocity and removing sediments and their associated nutrients before they reach surface waters.

Riparian buffers can consist of deep-rooted trees, shrubs, or forested area (Zone 1); herbaceous vegetation (Zone 2); and grass filter strips (Zone 3). While three separate zones are preferable, riparian buffers should consist of at least Zones 1 and 2. Refer to NRCS CPS Riparian Forest Buffer (Code 391) for details.

Stream and River Protection 3.1.3.	Revegetate bare areas in the above riparian buffers, field borders, filter strips, or non-fertilized vegetated filter strips if the bare areas reduce the function of the buffer.

Guidance: Riparian buffers are highly effective, although regular maintenance is required for them to remain so. Producers must inspect riparian buffers frequently and repair rills or channels that may develop following heavy rain. Revegetate bare areas to ensure the effectiveness of buffers.

Stream and River Protection 3.1.4.	Install and maintain temporary fencing or other access control along areas adjacent to perennial streams when stream banks have significant (more than 20 percent) rill or gully erosion resulting from the operation. Temporary access control is appropriate for grow-in of riparian buffer installation or repairs.

Guidance: Temporary fencing or other access control along streams can reduce or prevent erosion and water quality degradation and can facilitate the establishment of new riparian areas or the recovery of existing buffers following disturbance. If necessary, control livestock access to degraded riparian areas until the desired level of recovery is attained. Adequate rest following high intensity, short term grazing in riparian areas will help vegetation recover more quickly. Before installing fencing, consider alternative approaches such as placing feed, mineral supplements, scratching posts, dusters, windbreaks, alternative water sources, and shade structures away from the stream as far as practical.

3.2 Springs and Sinkholes

Springs and Sinkholes 3.2.1.	Buffer springs and spring runs with a minimum of 100 feet of non-fertilized vegetation.
3.2.2.	Buffer sinkholes and other visible karst features with a minimum of 50 feet of non-fertilized vegetation.

Guidance: Spring water directly reflects the quality of groundwater in an area. FDEP works with the WMDs and local stakeholders to define the major groundwater contributing areas for springs (i.e., springsheds), and to identify measures to help restore springs water quality in relevant BMAPs. Producers can protect springs water quality by preventing nutrients from leaching past the root zone of pastures and into groundwater. Implementing the 4R principles and recommended irrigation management strategies help producers comply with groundwater and springs regulations.

Springs and Sinkholes 3.2.3.	Never dispose of any materials into sinkholes.

Guidance: Sinkholes provide direct access to the groundwater that supplies drinking and irrigation water; therefore, never use sinkholes to dispose of trash, animal waste, or other material. Vegetated buffers or fencing around sinkholes and visible karst features may be required in some cases to prevent runoff into groundwater.

Springs and Sinkholes 3.2.4.	In Outstanding Florida Springs BMAPs adopted by FDEP, do not exceed appropriate fertilizer rates for N, based on crop nutrient requirements as described in practice 1.2.4.

Guidance: Part VIII, Chapter 373, F.S., includes more stringent springs protection requirements within an Outstanding Florida Springs (OFS) BMAP. Equine operations in BMAP areas are required to implement BMPs and to consider adopting new, emerging technologies to help protect springs and other water resources. Within OFS BMAPs, do not exceed appropriate agronomic rates for N, which is the limiting nutrient for springs and groundwater.

Springs and Sinkholes 3.2.5.	Within Outstanding Florida Springs BMAPs, manure storage areas located in a karst area must be on an impervious surface or covered with a tarp or other waterproof material to prevent leaching.

Guidance: Part VIII, Chapter 373, F.S., includes more stringent springs protection requirements within an OFS BMAP. Locations of the OFS BMAPs can be found on the Department of Environmental Protection website - https://floridadep.gov/fgs/fgs/media/map-outstanding-florida-springs. Protect stockpiled manure from rainfall and other risks of nutrient leaching by storing on an impervious surface, or under a roof or other waterproof material unless justification is provided (such as sampling or monitoring) to demonstrate that existing storage will not result in nutrient leaching to water resources.

3.3 Wetlands and Lakes

Wetlands and Lakes 3.3.1.	Buffer wetlands with a minimum of 25 feet of non-fertilized vegetation or consistent with ERP buffers when they are established by permit.
3.3.2.	Buffer impaired waterbodies located within adopted BMAP areas with a minimum of 50 feet of non-fertilized vegetation or consistent with ERP buffers when they are established by permit.
3.3.3.	If fencing through wetlands, keep cleared areas for fencing no wider than 25 feet.
3.3.4.	Remove horses from flooded areas until flooding subsides, when practical.

Guidance: Florida wetlands generally include swamps, marshes, bayheads, bogs, cypress domes and strands, sloughs, wet prairies, riverine swamps, hydric seepage slopes, tidal marshes, mangrove swamps, and other similar areas. Use an NRCS county soil survey map to help identify the locations of wetlands, hydric soils, or frequently flooded areas. If you do not have an ERP, (which requires a wetlands delineation map) seek technical assistance from the applicable WMD to determine if there are wetlands on the property. Rule Chapter 62-340, F.A.C., provides the methodology that state and local governments in Florida use to delineate the boundaries between wetlands and uplands and other surface waters.

Under certain conditions, enhancement or restoration of wetlands may be a BMP-eligible cost share practice or project to control N and P. For example, nutrient retention in wetland soils and in biomass can be an effective BMP to prevent loss of nutrients offsite. If considering this approach, your local FDACS, NRCS, or WMD representatives can provide assistance and possible financial support. Do not dredge or fill in wetlands unless you are issued a permit or are determined to be exempt. It is important to consult with FDACS, the local WMD, and the NRCS prior to conducting activities in or near wetlands to ensure compliance with any permitting requirements or NRCS program eligibility requirements.

Wetlands and lakes benefit from non-fertilized vegetative buffers. Fencing may also help protect or restore wetlands and lakes in some areas. Temporary livestock access control can promote

regrowth of wetland vegetation and buffers. Subsequent light or moderate grazing in wetlands can benefit the overall ecology of the system.

Rotational grazing systems are fundamental in managing forage production. Rotational grazing is the grazing of two or more subdivisions of pasture in sequence, followed by a rest period for recovery and re-growth. Rotational grazing has advantages such as improved pasture longevity, more timely utilization of forage, conservation of surplus forage, and increased stocking rates. One particularly useful type of rotational grazing is flash-grazing. A well-designed and properly managed flash-grazing system can be an effective tool for controlling woody and noxious plants, decreasing fuel buildup, and facilitating nutrient uptake along watercourse banks or around wetlands. Incorporate a flash grazing system in established wetland exclusion areas to manage the existing vegetation without degrading the resource.

3.4 Ditch and Canal Maintenance and Water Management

Ditch and Canal Maintenance and Water Management 3.4.1.	Maintain perennial herbaceous vegetation on all ditch and canal banks to protect them from erosion or provide an alternative means for preventing sediment from moving off site.

Guidance: Many agricultural operations use ditches to manage stormwater runoff from pastures. Ditches can carry sediments and nutrients from pastures into receiving waters. Ditches that are properly designed and maintained, however, provide treatment and minimize effects on water quality. In many cases, vegetation on ditch banks or in ditches will protect the ditches from erosion and trap sediments to prevent offsite transport downstream. When properly maintained, water control structures also help to slow the velocity of ditch water and prevent bank erosion. Retaining water in ditches promotes nutrient removal and sediment settling. Vegetated buffers along ditch and canal banks also help stabilize banks, and trap and reduce sediments and nutrients from entering these conveyances.

Ditch and Canal Maintenance and Water Management 3.4.2.	When sediments are observed in runoff moving off site, work with FDACS to evaluate the feasibility of implementing appropriate settling measures.

Guidance: Where water resource concerns are identified, producers must implement appropriate settling measures to improve the existing hydrologic conditions and slow/detain runoff. Where the installation of new water control measures is necessary, consideration should be given by FDACS to the feasibility and practicality (including costs considerations) of installing such water control measures. In determining feasibility, producers should coordinate with FDACS for technical assistance and cost share availability.

Ditch and Canal Maintenance and Water Management 3.4.3.	Operate and maintain water control structures to minimize the movement of N, P, and sediment off site.

3.4.4.	Operate and maintain water control structures to minimize the admission of aquatic vegetation into downstream public waterways.

Guidance: Routinely remove any accumulated aquatic weeds at the riser board control structure(s) to maintain proper drainage.

Ditch and Canal Maintenance and Water Management 3.4.5.	Do not remove sediments below the ditch's original invert elevation unless installation or maintenance of sumps or sediment traps is required. Original invert elevations can be determined by engineering drawings or changes in soil characteristics and color.
3.4.6.	Ensure that pump intakes are sufficiently elevated from the bottom of water conveyances, or consistent with an ERP to reduce sediment and debris in offsite discharges.

Guidance: Pumps are often used to move water within an agricultural operation, depending on the situation or need. Axial flow pumps are typically chosen when there is a need to move surface water from one body of water to another (e.g., ditch to ditch, pond to ditch) because they can quickly move large amounts of water using less energy consumption compared to other pumps. It is important for producers to minimize offsite discharges and comply with permit requirements for pumped discharges. Placing the pump intake above the ditch invert is necessary to minimize the disturbance of the bottom of the ditch when the pump is operational. Automation can allow the pump to shut off when the water level in the ditch drops to a point below the intake where further drainage could cause the pump to intake air and malfunction.

Ditch and Canal Maintenance and Water Management 3.4.7.	Install gutters and downspouts on all buildings adjacent to HIAs and divert the water away from the HIA toward pastures or other vegetated areas.

Guidance: Stormwater management is needed to help reduce erosion and help divert water away from HIAs. Installing gutters and downspouts will help maintain vegetation and improve erosion areas by redirecting stormwater from the barns and other covered areas in an equine operation. Installing this equipment will help direct the water to vegetated areas to help improve water quality.

Ditch and Canal Maintenance and Water Management 3.4.8.	Use spreader swales (or other means as needed) to intercept water discharging from the ditch(es), in order to reduce flow velocities and provide sheetflow through vegetative buffers prior to reaching the wetlands.

Guidance: Spreader swales and filter strips help reduce suspended solids and associated contaminants in runoff and excessive sediment in surface water or help improve water quality. Using spreader swales can help reduce the speed at which the water flows through the land surface to minimize impacts to the vegetation by means of dispersing sheetflow across the land

surface. Spreader swales can be used to divert stormwater or washing areas to vegetated or grass buffers.

3.5 Erosion Control

Site characteristics such as clay soils, sandy soils, or sloped terrain can significantly increase the risk of erosion and offsite sediment transport. Removal of natural vegetation and topsoil further increases the potential for soil erosion. The most effective method of erosion control uses vegetation to hold soil in place and decrease the velocity of runoff water.

Erosion Control 3.5.1.	Construct and maintain above-grade access roads so that they minimize the impeding or diversion of surface water flow.
3.5.2.	Maintain vegetative cover or alternative means for stabilizing road banks to prevent sediments from moving off site. Describe the alternative means in the Comments section [of the BMP Checklist].
3.5.3.	Locate and size permanent crossing areas over surface waters to minimize adverse effects to water resources.
3.5.4.	Stabilize all crossings over streams and creeks using rocks, culverts, bridges, or other methods to prevent erosion.

Guidance: Properly constructed access roads help prevent water quality effects by eliminating the formation of gullies. If improperly constructed, access roads can be a potential source of long-term erosion and sedimentation problems. Access roads constructed entirely in uplands, at or near grade, usually result in little to no effects to water resources. Above-grade access roads with appropriately-sized culvert crossings to maintain surface water flows also pose little to no water resource threats when properly designed, constructed and maintained. Refer to NRCS CPS Code 560 and Code 578 for guidance on designing and constructing access roads and water crossings, to prevent impacts to water quality.

Check with the appropriate WMD when constructing access roads through wetland areas or over navigable waterways to determine how to remain in compliance with district regulations.

When pasture is present on both sides of a stream, it may be necessary to install a crossing to allow livestock to move between pastures. The width of a hardened crossing is typically limited to discourage livestock from loitering in the water. NRCS CPS Stream Crossing (Code 578) guidelines specify a 6-foot minimum width for livestock crossings and 10 feet for vehicular low water crossings. A fenced lane often requires regular maintenance as debris can be trapped during high flows and the fence may be damaged during flood events.

3.6 Wellhead Protection

Wellhead Protection 3.6.1.	Inspect wellheads and pads for significant leaks or cracks and make any necessary repairs.
3.6.2.	Prevent contamination by using backflow prevention devices at wellheads if injecting fertilizer or chemicals, or if shared with a potable use source.
3.6.3.	Cap or valve any existing flowing wells.
3.6.4.	Retrofit existing wells with a concrete collar or fence where necessary to protect them from livestock.

Guidance: With most of Florida's water supply originating from groundwater, it is important for agricultural operations to protect wellheads from contamination. Contact your WMD before installing a new well to determine if a well construction permit and/or Consumptive Use Permit is required.

Locate new wells away from possible pollutant sources, such as petroleum storage tanks, septic tanks, chemical mixing areas, or fertilizer storage facilities. Regularly inspect wellheads and pads for leaks or cracks, and repair structures to prevent possible groundwater contamination. For existing wells, backflow prevention devices are required if injecting any fertilizers or chemicals or if connected to any potable water use.

Exclude livestock within a 75-foot radius of the wellhead of potable wells. This radius can be reduced if well construction records demonstrate well casing depths that extend through confining layers. Retrofit existing wells with a concrete collar and fence to protect them from livestock effects.

3.7 Non-Fertilizer Material Storage and Handling

Non-Fertilizer Material Storage 3.7.1.	Store pesticides separate from fertilizers in an enclosed, roofed structure with an impervious floor and lockable door, at least 100 feet away from wells, surface waters, or sinkholes.

Guidance: Proper storage, handling, and disposal of pesticides, solvents, and other chemicals can help avoid adverse environmental effects, protect the water supply, and reduce exposure of the owner to legal liability for contamination and cleanup. Store these materials away from fertilizers, under a roof, and ideally on an impervious surface that does not have floor drains. Some pesticides include active ingredients that are toxic or poisonous to humans and they should be stored in a more secure manner than fertilizers.

Non-Fertilizer Material Storage 3.7.2.	Mix and load pesticides on an impermeable surface, use portable mix/load stations, or conduct any field mix/load activities at random locations in the field.
3.7.3.	Recycle or properly dispose of used oil, solvent bath waste, and antifreeze in accordance with state and federal laws.

Guidance: Load pesticides into application equipment away from wells and surface waterbodies. A concrete or asphalt pad with rainfall protection is an ideal mixing/loading site, as this allows for easy recovery of spilled material. If this is not feasible, loading at random locations

in the field is acceptable and will prevent a buildup of pesticide residues in one location. Clean up spilled material immediately.

3.8 Additional Water Resource Protection BMPs for Equine Operations

Livestock Water Requirements and Sources

Additional Water Resource Protection BMPs for Equine Operations 3.8.1.	Locate and maintain watering troughs and supplemental feeding and mineral stations at least 100 feet away from surface waters and sinkholes as practicable for the operation.

Guidance: Alternative livestock watering is generally provided by water from excavated upland ponds and/or pumped into troughs from groundwater wells or surface water. Calculate the equine water needs and ensure that the upland watering sources are adequate to supply those needs. Strategic placement of watering troughs and excavated ponds in uplands away from water resources helps prevent water quality effects from livestock. Locate cooling or watering ponds so that any discharges will not reach surface waters. Further prevent runoff by constructing a shallow berm around watering ponds. Careful planning and site-specific decisions for equine water sources can play an important role in protecting water quality and can prevent the need to install costly fencing adjacent to natural waterbodies. Fencing may still be needed, however, based on the intensity of operations or location of the operation adjacent to water resources.

High-Intensity Use Areas

Additional Water Resource Protection BMPs for Equine Operations 3.8.2.	Direct runoff from all high intensity use areas (HIAs) away from surface waters, wells, or sinkholes using filter strips, buffers, berms, grassed waterways, or swales.
3.8.3.	Locate all HIAs as far from surface waters, sinkholes, or wells as practicable for the operation. HIAs must be 200 feet from these resources unless pre-existing at the time of enrollment.

Guidance: High intensity use areas (HIAs), where livestock congregate for extended periods of time, can adversely impact both the environment and the animal's health. Feeding areas, arenas, loafing areas, watering troughs, mineral feeders, and shade structures may create HIAs where manure and urine become concentrated. Manure management for HIAs in equine operations is a concern for groundwater and surface water due to potential nutrient transport and the possible introduction of coliform bacteria, which can cause health risks to animals and humans at elevated concentrations.

Effective management of HIAs reduces environmental effects and supports equine health. The primary BMP to treat HIA runoff is to direct runoff away from a waterbody and through vegetated buffer strips, berms, spreader swales and grassed waterways. HIAs that are created through typical equine operation activities are allowed, provided there is no untreated, direct discharge from the HIA off-site.

The process of weaning foals and raising yearlings can result in more animal units per acre, which may require imported feed, create HIAs, and require additional efforts to reduce impacts to water resources. Additional practices for HIAs include revegetating holding areas, rotating feed bunks when equine are removed to help prevent runoff, and maintaining non-fertilized vegetated buffers adjacent to streams and wetlands.

Forage, Pasture, and Grazing Management

Additional Water Resource Protection BMPs for Equine Operations 3.8.4.	Incorporate cross-fencing to subdivide larger pastures and implement rotational grazing, where appropriate. If installing fences in wetlands, follow the criteria in BMP 3.3.3.
3.8.5.	Avoid overgrazing by considering the grazing height information in Table 2 to ensure that pastures are not denuded and have adequate residue for regrowth.
3.8.6.	Utilize grazing schedules using NRCS Conservation Practice Standard (CPS) Prescribed Grazing (Code 528) for guidance.

Guidance: Well-managed pastures and rangeland with appropriate stocking rates typically present little to no water quality problems from equine excrement because most of the available P is recycled during decomposition. Well-established and managed pastures effectively reduce soil erosion, absorb nutrients, reduce weedy species, and provide essential nutrition for livestock. Improper grazing management, however, can lead to nutrient leaching or runoff from pastures. Intensive practices (e.g., reseeding and weed control) may be necessary for extremely degraded pastures, and periodic ground-shaping may be necessary to encourage dispersed flow and prevent erosion.

Prescribed grazing systems such as continuous or rotational systems and supplemental winter grazing can facilitate healthy forage stands and pastures. Continuous grazing allows livestock unrestricted access to a pasture throughout a year or grazing season and has advantages such as lower input costs and fewer management decisions. Rotational grazing of two or more subdivided pastures in sequence, followed by a rest, recovery, and re-growth period is generally more productive and yields better forage growth than continuous grazing. Supplemental winter grazing is most effective when cross-fencing is used to subdivide pastures into multiple sections. Managed grazing also allows for a more even distribution of manure across pastures and reduces denuded areas and walking trails.

Manage rotationally grazed pastures based on forage grazing heights as shown in Table 2. When practical, overseed with small grain in the winter to improve nutritional content, provide continuous uptake of excreted nutrients, improve soil conditions, and help prevent erosion.

Table 2. Forage Growing Season Grazing Height (inches)		
Forage	Begin Grazing	End Grazing
Bahiagrass	6	1-2
Bermudagrass	6	2-4
Bluestem	10-20	8
Perennial peanut	12-14	4
Clovers	6	3
Indiangrass	14	6-10
Limpograss	24	10
Maidencane	24	10
Pearl Millet	14	6
Ryegrass, annual	6	3-4
Stargrass	12-18	6-8
Small Grains (oats, wheat, rye)	6	4
Switchgrass	18-22	8-12

Incorporating legumes into either existing or new pastures on equine operations is practical and useful in forage production systems. Legume-grass mixtures and multi-species grass mixtures, combined with equine grazing can improve soil health and water quality. Nitrogen fixation from cool-season legumes enables producers to reduce the amount of N needed on the warm-season grasses in the spring. Cover crops are effective at protecting and reducing impacts to water quality, reducing nutrient leaching and runoff, and increasing soil organic matter. Livestock manure will also increase soil organic matter. Livestock recycles a considerable amount of N, which has been shown to reduce the N needs of the subsequent crop while reportedly providing higher yields compared to non-grazed rotations.

Additional Water Resource Protection BMPs for Equine Operations 3.8.7.	Drag pastures, as needed, to distribute manure evenly across the pasture.
3.8.8.	Spread manure at appropriate rates using a spreader designed for pasture application of manure.

Guidance: Poorly managed manure can be a source of nutrient and pathogen pollution to surface waters or sinkholes and can create health issues for livestock, provide a breeding ground for flies and insects, produce objectionable odors, and draw negative attention from neighbors and the public. When managed and used properly, manure can provide valuable fertilizer and soil amendments, reduce a farmer's dependence on commercial products, and save money. Livestock bedding, including stall waste and chicken litter, are included in manure management.

Practices such as dragging manure piles in your pasture will distribute nutrients and help break down the piles. This practice is best done in hot, dry weather. UF/IFAS Extension agents can

provide guidance on sizing and constructing an appropriate composting system to meet the needs of the operation.

Another option is to collect and spread the manure or litter on crops or pastures every few days, depending on the quantity generated, although using raw manure can be tricky. Collecting it can be time consuming, the nutrient content can vary based on livestock type, and it can injure crops if not mixed with straw, woodchips, or some other carbon source. Further, irrigation or rainfall can wash raw manure into waterbodies and cause pollution. The University of Florida Livestock Waste Testing Laboratory will test manure samples and provide recommendations for crop applications for a fee, but fresh manure should not be applied to crops without first checking with a UF/IFAS Extension Agent to determine if there is potential for food safety issues. A better alternative to spreading raw manure is to collect and store it for later use, which allows time for nutrients to break down to forms usable by plants.

Equine Washing Areas

Additional Water Resource Protection BMPs for Equine Operations 3.8.9.	Whether permanent or temporary washing areas are used, locate them at least 50 feet away from surface waters and domestic septic tank drainfields. Direct runoff to a well-vegetated area.

Guidance: Horse wash rack areas can result in a concentration of water runoff and erosion of the receiving areas nearby. Incorporating swales, ditches or vegetated areas where the water leaves the washing areas can help improve water resources. Direct runoff to well-vegetated areas and away from surface waters, wells, or sinkholes.

Animal Mortality Management for Equine Operations

Additional Water Resource Protection BMPs for Equine Operations 3.8.10.	For below-ground burial, locate any burial site at least 100 feet from adjacent property and at least 200 feet from surface waters, well, or sinkholes.

Guidance: Animal mortality management involves the proper transport and disposal of dead animals to avoid impacts to water quality and water resources by the correct placement of the burial site. Proper management of mortalities will also protect surface waters from organic loads and will prevent the movement of organisms to surface or groundwater and will, therefore, reduce the risk of transmitting diseases to healthy livestock and the water resources. While transporting carcasses, keep them contained in a sanitary manner to prevent spreading infection. Clean and disinfect any mechanical equipment surfaces that were in contact with the carcasses.

Animal Pharmaceutical Management for Equine Operations

Additional Water Resource Protection BMPs for Equine Operations	Dispose of spent needles in an approved biomedical container, or by following other guidance approved by the EPA.

3.8.11.	

Guidance: Proper disposal of spent needles, referred to as “sharps”, is regulated by EPA. These regulations require that needles be disposed of in a biomedical container designed for collection of sharps. Spent needles should be collected in these containers to avoid contamination of other sources such as manure piles or water resources. Properly disposing of these items can help prevent contamination of manure that is being land applied.

4.0 Reference Materials

The reference material listed below is intended for informational purposes and is not intended to be incorporated by reference pursuant to Rule 1-1.013, F.A.C.

Nutrient Management References

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Irrigation Management References

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Water Resource Protection References

1. Best Management Practices for Agrichemical Handling and Farm Equipment Maintenance Manual, Florida Department of Agriculture and Consumer Services / Florida Department of Environmental Protection. https://www.fdacs.gov/ezs3download/download/22551/515251/BMP_Agrichemical_Handling.pdf.
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The following NRCS Conservation Practice Standards were referenced in the compilation of this manual and used to support FDEP initial verification of the manual.

NRCS Conservation Practice Code

Nutrient management

Code 317	Composting Facility
Code 511	Forage Harvest Management
Code 512	Forage and Biomass Planting
Code 590	Nutrient Management
Code 592	Feed Management

Irrigation Management

Code 442	Irrigation Sprinkler System
Code 449	Irrigation Water Management
Code 554	Drainage Water Management
Code 607	Surface Drainage Field Ditch
Code 608	Surface Drainage Main or Lateral

Water Resource Protection

Code 313	Waste Storage Facility
Code 314	Brush Management
Code 317	Composting Facility
Code 327	Conservation Cover
Code 338	Prescribed Burning
Code 342	Critical Area Planting
Code 350	Sedimentation Basin
Code 351	Well Decommissioning
Code 362	Diversion
Code 382	Fence
Code 386	Field Border
Code 390	Riparian Herbaceous Cover
Code 391	Riparian Forest Buffer
Code 393	Filter Strip
Code 410	Grade Stabilization
Code 412	Grassed Waterway
Code 472	Access Control
Code 527	Karst Sinkhole Treatment
Code 528	Prescribed Grazing
Code 550	Range Planting
Code 558	Roof Runoff Structure

Code 560	Access Road
Code 574	Spring Development
Code 576	Livestock Shelter Structure
Code 578	Stream Crossing
Code 584	Channel Bed Stabilization
Code 587	Structure for Water Control
Code 612	Tree/Shrub Establishment
Code 614	Watering Facility
Code 633	Waste Utilization
Code 634	Waste Transfer
Code 642	Water Well
Code 644	Wetland Wildlife Habitat Management
Code 657	Wetland Restoration
Code 717	Livestock Shade Structure
Code 779	Livestock Cooling Pond

5.0 Appendices

Appendix 1: Glossary

The definitions that follow only apply to *Florida Equine Operations, 2024 Edition: Water Quality and Water Quantity Best Management Practices*.

Animal feeding operation – (Rule 62-670.200, F.A.C.). A lot or facility (other than an aquatic animal production facility) where the following conditions are met:

(a) Animals have been, are or will be stabled or confined and fed, or maintained for a total of 45 days or more in any 12-month period; and

(b) Crops, vegetation, forage growth, or post-harvest residues are not sustained in the normal growing season over any portion of the lot or facility.

(c) Two or more animal feeding operations under common ownership are deemed to be a single animal feeding operation if they are adjacent to each other or if they utilize a common area or system for the disposal of wastes.

Animal unit (AU) – (Rule 62-670.200, F.A.C.). A unit of measurement for an animal feeding operation calculated adding the following numbers: the number of slaughter and feeder cattle multiplied by 1.0, plus the number of mature dairy cattle multiplied by 1.4, plus the number of swine weighing over 55 pounds multiplied by 0.4, plus the number of sheep multiplied by 0.1, plus the number of horses multiplied by 2.0.

Backflow Prevention Device – A mechanism installed on a water line near the water source that only allows water to go in one direction. It is designed to prevent potentially contaminated water from entering the potable supply. Examples of BPDs include air gap; Hose Bib Vacuum Breaker; Atmospheric Vacuum Breaker; Pressure Vacuum Breaker; Double Check Valve; Reduced Pressure Zone Device.

Basin management action plan (BMAP) – (section 403.067(7)(a), F.S.). The "blueprint" for restoring impaired waters by reducing pollutant loadings to meet the allowable loadings established in a TMDL. A BMAP represents a comprehensive set of strategies—permit limits on wastewater facilities, urban and agricultural BMPs, conservation programs, financial assistance, revenue generating activities, etc.—designed to implement the pollutant reductions established by the TMDL. BMAPs are broad-based plans developed with local stakeholders. BMAPs rely on local input and local commitment and are adopted by FDEP Secretarial order to be enforceable. Enrollment and proper implementation of BMPs, when verified by IV site visits and record retention, fulfills agricultural responsibilities under a BMAP.

Best management practice (BMP) – (section 373.4595(2)(a), F.S.) . A practice or combination of practices determined by the coordinating agencies, based on research, field-testing, and expert review, to be the most effective and practicable on-location means, including economic and technological considerations, for improving water quality in agricultural discharges. BMPs for agricultural discharges shall reflect a balance between water quality improvements and agricultural productivity.

Biosolids – (Rule 62-640.200, F.A.C.). The solid, semisolid, or liquid residue generated during the treatment of domestic wastewater in a domestic wastewater treatment facility, formerly known as “domestic wastewater residuals” or “residuals.” Not included is the treated effluent or reclaimed water from a domestic wastewater treatment plant. Also not included are solids removed from pump stations and lift stations, screenings and grit removed from the preliminary treatment components of domestic wastewater treatment facilities, other solids as defined in subsection 62-640.200(30), F.A.C., and ash generated during the incineration of biosolids. Biosolids include products and treated material from biosolids treatment facilities and septage management facilities regulated by FDEP.

Note: Class AA biosolids, which are considered commercial fertilizer, are excluded from regulation under Rule Chapter 62-640, F.A.C.

Comprehensive nutrient management plan – (Title 180, National Planning Procedures Handbook, Part 600.2(22)). Any combination of structural practices, management activities, or land management practices associated with crop or livestock production that collectively ensures that the purposes of crop or livestock production and preservation of natural resources (especially the conservation of air, soil, and water quality) are compatible.

Concentrated Animal Feeding Operation – (Rule 62-670.200(3), F.A.C.). A feeding operation where more animals are confined than are specified in the categories listed below. Any animal feeding operation that contains process wastewater and runoff from the 25-year, 24-hour storm event, is not considered a concentrated animal feeding operation regardless of the number of animals at the facility.

(a) 1,000 slaughter and feeder cattle; or
(b) 700 mature dairy cattle (whether milked or dry cows), except that dairy farms located in the Lake Okeechobee Drainage Basin as defined in subsection 62-670.200(8), F.A.C., shall be regulated pursuant to Rule 62-670.500, F.A.C.
(c) 2,500 swine weighing over 55 pounds each;
(d) 500 horses;
(e) 10,000 sheep or lambs;
(f) 55,000 turkeys;
(g) 100,000 laying hens or broilers (if the facility has continuous overflow watering);
(h) 30,000 laying hens or broilers (if the facility has a liquid manure handling system);
(i) 5,000 ducks, or
(j) 1,000 animals units.

Fertilizer – (576.011, F.S.) any substance which:

(a) Contains one or more recognized plant nutrients and promotes plant growth; or
(b) Controls soil acidity or alkalinity; or
(c) Provides other soil enrichment; or
(d) Provides other corrective measures to the soil.

The term “fertilizer” does not include unmanipulated animal or vegetable manures, peat, or compost which make no claims as described in paragraphs (a)-(d).

Flash-Grazing – Strategy for managing a normally excluded area with a large number of livestock for a short period to control woody or weedy plant species.

HIA – High intensity use areas are areas where livestock congregate for extended periods of time. This can include feeding areas, arenas, loafing areas, watering troughs, and near shade structures. These HIAs are heavily used and have high traffic of livestock.

Karst – A type of topography formed by dissolution of bedrock in areas underlain by limestone, dolostone or, as in some western states, gypsum. Such terrain has underground drainage systems that are reflected on the surface as sinkholes, springs, disappearing streams or even caves. (Florida Geological Survey, 2019).

Manure – (Rule 62-701.200, F.A.C.). A solid waste composed of excreta of animals, and residual materials that have been used for bedding, sanitary or feeding purposes for such animals.

Nonpoint source pollution – (section 502(14), Clean Water Act). Any source of water pollution that does not meet the legal definition of “point source” in section 502 (140 of the Clean Water Act. “**Point source**" means any discernible, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged. This term does not include agricultural storm water discharges and return flows from irrigated agriculture.

Nutrient management plan – Developed by producers to manage the source, rate, timing and placement of plant nutrients and soil amendments in a way that help budget, supply, and conserve nutrients, minimize agricultural nonpoint source pollution, and improve soil conditions. Refer to NRCS CPS Nutrient Management Code 590 for guidance.

Other watercourse – (section 373.019(14), F.S). Any canal, ditch, or other artificial watercourse in which water usually flows in a defined bed or channel.

Outstanding Florida Springs (OFS) – (section 373.802(5), F.S). Includes all historic first magnitude springs, including their associated spring runs, as determined by the FDEP using the most recent Florida Geological Survey springs bulletin, and the following additional springs, including their associated spring runs:

(a) De Leon Springs;
(b) Peacock Springs;
(c) Poe Springs;
(d) Rock Springs;
(e) Wekiwa Springs; and
(f) Gemini Springs.

The term does not include submarine springs or river rises.

Pesticide – (section 487.021, F.S.). Any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any insects, rodents, nematodes, fungi, weeds, or

other forms of plant or animal life or viruses, except viruses, bacteria, or fungi on or in living humans or other animals, which the department by rule declares to be a pest, and any substance or mixture of substances intended for use as a plant regulator, defoliant, or desiccant; however, the term “pesticide” does not include any article that:

(a) Is a “new animal drug” within the meaning of section 201(w) of the Federal Food, Drug, and Cosmetic Act;
(b) Has been determined by the Secretary of the United States Department of Health and Human Services not to be a new animal drug by a regulation establishing conditions of use for the article; or
(c) Is an animal feed within the meaning of section 201(x) of the Federal Food, Drug, and Cosmetic Act bearing or containing an article covered in this subsection.

Petiole sap test – A method for determining nutrient content in plants using the sap from the leaf stem of mature leaves.

Pollutant – A constituent that results in pollution, as defined in section 403.031(11), F.S.

Potable water well – (Rule 62-521.200, F.A.C). Any water well which supplies water for human consumption to a community water system or to a non-transient non-community water system. For the purpose of this rule, any potable water well installed by an installation used to serve that installation’s operation is excluded from this definition.

Prescribed grazing – The controlled harvest of vegetation by grazing or browsing animals, to achieve a specific objective (improve water filtration, protect stream banks, etc.).

Regional canal system – Water conveyances operated and controlled by local governments, special districts, Water Management Districts, or other governmental entities that typically serve larger geographic areas and multiple landowners and properties.

Riparian – Vegetated ecosystems along a waterbody, characterized by a high-water table and subject to periodic flooding and influence from the adjacent waterbody.

Sinkhole – A naturally occurring geological feature that has an open connection to groundwater. Areas that have topsoil and a root zone over the entire area or ponded areas that do not have an open connection to groundwater are not considered sinkholes for the purposes of this manual.

Spring – (Florida Geological Survey Bulletin 66, 2004). A point where underground water emerges to the earth’s surface (including the bottom of the ocean). Springs flow naturally from underlying aquifers and are classified based on their magnitude, or amount of flow coming from the spring vent. First magnitude springs discharge 64.6 million gallons per day (MGD) or more; second magnitude springs discharge from 6.46 to 64.6 MGD.

Springshed – (section 373.802(7), F.S.). Areas within the groundwater and surface water basins which contribute, based upon all relevant facts, circumstances, and data, to the discharge of a spring as defined by potentiometric surface maps and surface watershed boundaries.

Stocking rate – Refers to the amount of pasture required for each AU based on the number of animals on a pasture during a given amount of time.

Stream – (section 373.019(20), F.S.). Any river, creek, slough, or natural watercourse in which water flows in a defined bed or channel.

Surface waters – (Rule 62-302.200, F.A.C.). Water upon the surface of the earth, whether contained in bounds created naturally or artificially or diffused. Water from natural springs is classified as surface water when it exits from the spring onto the earth's surface.

Total maximum daily load (**TMDL**) – (Section 303(d) of the Clean Water Act, 33 U.S.C. §1251 et seq. (1972)). The calculation of the maximum amount of a pollutant allowed to enter a waterbody so that the waterbody will meet and continue to meet water quality standards for that particular pollutant. A TMDL determines a pollutant reduction target and allocates load reductions necessary to the source(s) of the pollutant.

Waters – (section 403.031, F.S.). Include, but are not limited to, rivers, lakes, streams, springs, impoundments, wetlands, and all other waters or bodies of water, including fresh, brackish, saline, tidal, surface, or underground waters. Waters owned entirely by one person other than the state are included only in regard to possible discharge on other property or water. Underground waters include, but are not limited to, all underground waters passing through pores of rock or soils or flowing through in channels, whether manmade or natural. Solely for purposes of section 403.0885, F.S., waters of the state also include navigable waters or waters of the contiguous zone as used in s. 502 of the Clean Water Act, as amended, 33 U.S.C. ss. 1251 et seq., as in existence on January 1, 1993, except for those navigable waters seaward of the boundaries of the state set forth in s. 1, Art. II of the State Constitution. (Additional text pertaining to waters of the state is provided in statute).

Watershed – Drainage basin or region of land where water drains downhill into a specified body of water.

Well – (section 373.303(7), F.S). Any excavation that is drilled, cored, bored, washed, driven, dug, jetted, or otherwise constructed when the intended use of such excavation is for the location, acquisition, development, or artificial recharge of groundwater, but such term does not include any well for the purpose of obtaining or prospecting for oil, natural gas, minerals, or products of mining or quarrying; for inserting media to dispose of oil brines or to repressure oil-bearing or natural gas-bearing formation; for storing petroleum, natural gas, or other products; or for temporary dewatering of subsurface formations for mining, quarrying, or construction purposes.

Wellhead – The structure directly over or adjacent to a well.

Wetlands – (section 373.019(27), F.S.). Those areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soils. Soils present in wetlands generally are classified as hydric or alluvial or possess characteristics that are associated with reducing soil conditions. The prevalent vegetation in wetlands generally consists of facultative or obligate hydrophytic macrophytes that are typically adapted to areas having soil conditions described above.

Appendix 2: Soil and Tissue Testing

Soil Testing

Basic soil testing involves four major steps: sample collection, sample analysis, interpreting results, and applying results on the operation. Consult with the soils laboratory or UF/ IFAS County Extension agents for assistance with soil sampling to ensure reliable results, interpretation, and application.

The following list includes standard extraction methods used at the UF/IFAS Extension Soil Testing Laboratory and most private laboratories for different soil types in Florida.

1. Mehlich-3 extraction – Used on mineral or organic soils over most pH levels.
2. AB-DTPA extraction – Used on alkaline (calcareous) soils with a pH of 7.4 and above.
3. Water extraction – Used for extraction of P on organic soils.
4. Bray 1 or Bray 2 extraction – Used for extraction of P on organic and mineral soils.
5. Ammonium acetate extraction – Used for extraction of phosphorus, potassium, magnesium, calcium, and silicon on mineral soils.
6. Mehlich-1 extraction – Used for mineral sols with pH 6.5 or less.

More information regarding soil testing for plant-available nutrients can be found in the Extension publication SL 408, at: https://edis.ifas.ufl.edu/publication/SS621.

Tissue Testing

Tissue analysis offers an estimate of a plant's nutritional status at the time of sampling. Nutrient deficiencies can be detected with tissue analysis before visual symptoms appear.

Appendix 3: Example Record Keeping Forms

The BMPs on the Checklist preceded with a pencil icon ( ) require records that must be kept for a minimum of five years to demonstrate compliance with the applicable BMPs for the subject parcel. All records are subject to collection and review pursuant to the requirements of section 403.067, F.S.

Producers are encouraged to maintain their records in electronic form for ease in completing the required IV site visit. Examples of records are shown below. OAWP has developed an Excel spreadsheet, available upon request, that can assist producers with keeping nutrient records. Contact an FDACS representative for a copy of the spreadsheet, choose commercially available recordkeeping software suited to your operation, or develop your own record keeping system to assist with IV site visit requirements.

Soil Sample Records (Retain all Laboratory Results)

Sample Date	Field Location	# of Samples	Name of Laboratory	Extraction Method	Records Location

Tissue Sample Records (Retain all Lab Results)

Sample Date	Field Location	# of Samples	Name of Laboratory	Records Location

Fertilization Records (Retain all Receipts)

Field Name				**Production Acreage**		**Year**		
Brand	Application method	Grade **N-P_2O_5-K_2O**	% CRN	% CRP_2O_5	Amount of fertilizer applied (**lbs/total production acreage**)	Amount of fertilizer applied (**lbs/acre**)	Total N applied (**lbs/acre**) or (**lbs/100 linear bed foot**)	Total P_2O_5 applied (**lbs/acre**)

Rainfall (inches) Year:_____

JAN.	FEB.	MAR.	APRIL	MAY	JUNE	JULY	AUG.	SEP.	OCT.	NOV.	DEC.

Well Records

LOCATION	YEAR CONSTRUCTED	CONSTRUCTED BY	LAST MODIFIED	MODIFIED BY	RECORDS LOCATION

Ditch/Waterway Records

LOCATION	DESIGN CROSS SECTION	CURRENT CROSS SECTION	DATE OF LAST CROSS SECTION INSPECTION	RECORDS LOCATION

Appendix 4: Buffers and Setbacks

Reference Table for Setbacks			
BMP #	**Practice**	**Setback (Feet)**	**Hydrologic Feature Type**
1.6.4	Manure storage areas	100	Private potable wells
1.6.4	Manure storage areas	200	Watercourses, sinkholes
1.6.4	Manure storage areas	300	Public Potable wells
3.2.1	Vegetated buffer	100	Springs, spring runs
3.2.2	Vegetated buffer	50	Sinkholes
3.3.1	Vegetated buffer	25	Wetlands
3.2.2	Fertilizer application	50	Watercourses, lakes, wetlands, sinkholes
3.6.4	Livestock exclusion	100	Drinking water wells
3.7.1	Pesticide Storage	100	Wells, surface waters
3.8.1	Water troughs, supplemental feed and mineral	100	Watercourses, lakes, wetlands, sinkholes, drinking water wells
3.8.3	High-intensity areas	200	Watercourses, lakes, wetlands, sinkholes
3.8.7	Horse washing areas	50	Waterbodies, wells, drainfields
3.8.8	Burial sites	200	Watercourses, streams, wetlands, wells, sinkholes