



Best Management Practices for Georgia Agriculture

Conservation Practices to Protect Surface Water Quality

Georgia Soil & Water Conservation Commission
Athens, GA
www.gaswcc.georgia.gov

The preparation of this manual was financed in part through a grant from the U.S. Environmental Protection Agency to the Environmental Protection Division of the Georgia Department of Natural Resources under Provisions of Section 319(h) of the Federal Water Pollution Control Act, as amended.

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Second Edition

Developed by:

The Georgia Soil & Water Conservation Commission

The Georgia Soil & Water Conservation Commission would like to thank everyone that originally provided information and comments for this manual. The following agencies and organizations were represented on the steering committee for this manual.

Georgia Agribusiness Council
Georgia Association of Conservation District Supervisors
Georgia Cattlemen's Association
Georgia Conservancy
Georgia Department of Agriculture
Georgia Environmental Protection Division, Coastal Division
Georgia Farm Bureau
Georgia Forestry Commission
Georgia Peanut Commission
Georgia Poultry Federation
The Nature Conservancy
U.S. Environmental Protection Agency, Region 4
USDA Farm Service Agency, Georgia Office
USDA Natural Resources Conservation Service, Georgia Office
University of Georgia College of Agricultural & Environmental Sciences-
Cooperative Extension Service

September 2013

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TABLE OF CONTENTS

Acronyms	<u>iv</u>
Chapter 1. Introduction	
Purpose of the Manual	<u>1.1</u>
Best Management Practices Index	<u>1.3</u>
Nonpoint Source Pollution & Control Chart	<u>1.5</u>
Practice Definitions & Other Important Terminology	<u>1.6</u>
Chapter 2. Best Management Practice Planning	
Section 1: Plan to Manage and Manage to Plan	<u>2.1</u>
Section 2: Nutrient Management Planning for Your Farm	<u>2.3</u>
Section 3: General Farm Management Planning	<u>2.5</u>
Section 4: Animal Waste Management Planning	<u>2.13</u>
<i>Minimum Requirements for CAFOs</i>	<u>2.16</u>
Section 5: Irrigation Water Management Planning	<u>2.42</u>
Section 6: Row Crop Management Planning	<u>2.51</u>
Section 7: Wetlands & Stream Protection Management Planning	<u>2.78</u>
Chapter 3. Additional Information	
Georgia Agricultural Organizations Information	<u>3.1</u>
Georgia State Agencies Information	<u>3.2</u>
Federal Agencies Information	<u>3.3</u>
Pesticide Handling, Disposal & Emergency Information	<u>3.4</u>
<i>Pesticide Online Information</i>	<u>3.5</u>
For Additional Information	<u>3.6</u>
Mandatory Federal BMPs for Roads in Wetlands	<u>3.7</u>

ACRONYMS

AFO

Animal Feeding Operation

BMP

Best Management Practice

CAFO

Concentrated Animal Feeding Operation

CNMP

Comprehensive Nutrient Management Plan

EPA

Environmental Protection Agency

EQIP

Environmental Quality Incentives Program

GAEPD

Georgia Environmental Protection Division

GFC

Georgia Forestry Commission

GDA

Georgia Department of Agriculture

IPM

Integrated Pest Management

NMP

Nutrient Management Plan

NPS

Nonpoint Source (Pollution)

SWCD

Soil & Water Conservation District

UGA CES

University of Georgia Cooperative Extension Service

USDA FSA

Farm Service Agency

USDA NRCS

Natural Resources Conservation Service

INTRODUCTION

PURPOSE OF THE MANUAL

This manual is designed to provide the agriculture community with knowledge of the best management practices (BMPs) that work to protect surface water quality as well as to help agency personnel educate farmers about BMPs and their usefulness. *Best Management Practices for Georgia Agriculture* is a compilation of conservation practices that address surface water quality and includes an estimate of the effectiveness and relative cost of each BMP. This second edition of the manual also includes an expanded section on nutrient management planning.

The Federal Water Pollution Control Act, otherwise known as the Clean Water Act, is considered the cornerstone for U.S. water quality policy. This legislation established current policy and created new programs to protect water resources. The term “best management practice” was introduced in the Clean Water Act and relates to methods of reducing the amount of pollutants entering water bodies (rivers, marine waters, streams or lakes). A BMP is defined as a practice or combination of practices determined to be the most effective practical means of preventing or reducing the amount of pollution generated by nonpoint sources to a level compatible with water quality goals. For water bodies that are already polluted, the federal government requires the development of total maximum daily loads (TMDLs). BMPs are used as a tool in TMDL Implementation Plans to reduce and prevent pollutants from entering water sources and to lower the number of water bodies failing to meet federal and state water quality standards.

Nonpoint source (NPS) pollution is a broad-based term used in environmental regulations and policy. The agriculture industry has been identified by the U.S. Environmental Protection Agency (US EPA) as significant sources of NPS pollution in the United States. Much of the difficulty with NPS pollution is in defining the source of this type of pollution. NPS pollution can be a slow, gradual process or a sudden, unpredictable process in which there is a release of pollutants into water bodies. Typically, NPS pollution is unintentional. Small, often unobservable releases of pollutants in runoff from fields, animal manure land applications, and animal access to water sources add up over time as a source of water quality degradation. Common agriculture related pollutants in Georgia are pathogens, sediment (organic and inorganic) and nutrients (nitrogen and phosphorus), which result in water failing to meet designated use standards.

Agricultural producers should be very concerned about potential contaminants and should take advantage of available opportunities to reduce negative environmental impacts from their operations. BMPs are versatile and allow producers to select practices that best fit their type of production and operation. While no single practice is the answer for pollution problems, the combination and implementation of BMPs, even on a small scale, can reduce overall water quality degradation. Selecting and implementing practices that work together to reduce pollutant transport, along with sound management decisions, will provide a larger reduction in pollutants than using a single practice.

Numerous other conservation practices exist but are not included in this manual. More detailed information can be found in the references provided at the end of the manual. Actual costs are not provided in this manual

as they will vary by producer and region, but ranges are provided. Any conservation agency representative can provide you with more information on these practices and how to properly implement them on your operation. NRCS specifications for all conservation practices can be obtained online from the NRCS website. In this manual, you will find a number next to the practice name at beginning of each practice description. This number is a reference for the NRCS Conservation Practice Standard number. You will also find the same information at the bottom of the page in the Additional Resources section. Other practices that are discussed will also be listed as well as sources of more information or guidance. In addition, state and federal contact information, Georgia agricultural organizations contact information and other resources have been provided in Chapter 3 of this manual.

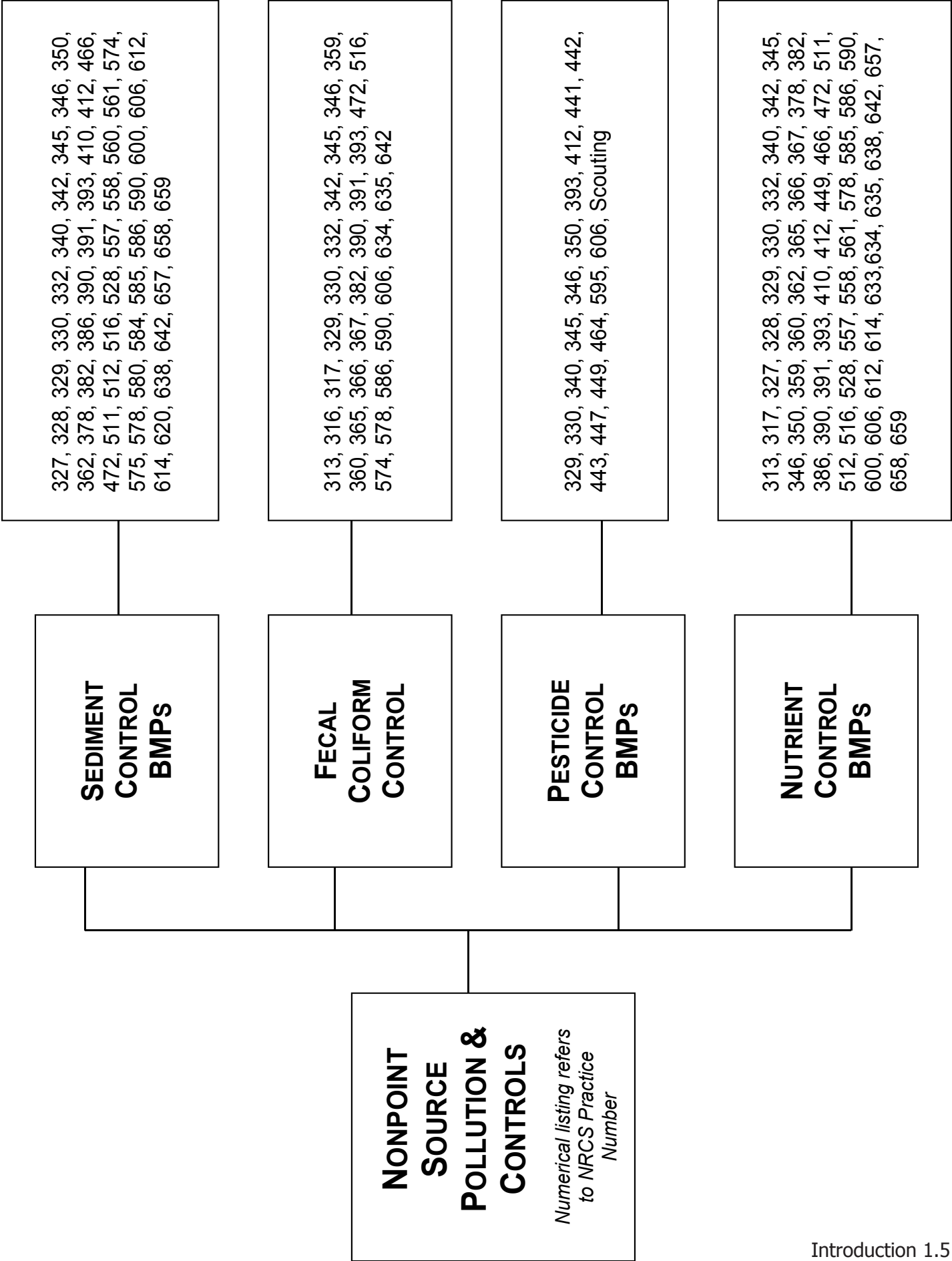
This manual is laid out in seven planning sections. First is [Planning for Your Farm](#) followed by [Nutrient Management Planning for Your Farm](#), [General Farm Management Planning](#), [Animal Waste Management Planning](#), [Irrigation Water Management Planning](#), [Row Crop Management Planning](#) and lastly, [Wetlands & Stream Protection and Management Planning](#). At the beginning of each section, you will find a flow chart that will help guide you to the practices that address specific pollutant issues on your farm. You will notice that some of the practices listed on the flow chart will not be found in that particular section. Since some practices fall into more than one planning section, they have been located in the most relevant section. Practices in other planning sections that are not listed on the flow charts may also be applicable to your farm operation. Be sure to review each section in order to identify the BMPs that best fit your farming operation.

BEST MANAGEMENT PRACTICES INDEX

Below is a list of the conservation practices included in this manual by their corresponding NRCS Conservation Practice Number.

Practice Number	Practice Name
313	<u>Waste Storage Facility</u>
316	<u>Animal Mortality Facility</u>
317	<u>Composting Facility</u>
327	<u>Conservation Cover</u>
328	<u>Crop Rotation</u>
329	<u>Conservation Tillage - No Till</u>
345	<u>Conservation Tillage - Mulch Till</u>
346	<u>Conservation Tillage - Ridge Till</u>
330	<u>Contour Farming</u>
332	<u>Contour Buffer Strip</u>
340	<u>Cover Crop</u>
342	<u>Critical Area Planting</u>
350	<u>Sediment Basin</u>
359	<u>Waste Treatment Lagoon</u>
360	<u>Waste Facility Closure</u>
362	<u>Diversion</u>
365	<u>Anaerobic Digester - Ambient Temperature</u>
366	<u>Anaerobic Digester - Controlled Temperature</u>
367	<u>Waste Facility Cover</u>
378	<u>Pond</u>
382	<u>Fence</u>
386	<u>Field Border</u>
390	<u>Riparian Herbaceous Cover</u>
391	<u>Riparian Forest Buffer</u>
393	<u>Filter Strip</u>
410	<u>Grade Stabilization Structure</u>
412	<u>Grassed Waterway</u>
441	<u>Microirrigation</u>
442	<u>Irrigation Sprinkler</u>
443	<u>Surface & Subsurface Irrigation</u>
447	<u>Irrigation Tailwater Recovery System</u>
449	<u>Irrigation Water Management</u>
464	<u>Irrigation Land Leveling</u>
466	<u>Land Smoothing</u>
472	<u>Access Control</u>

511	<u>Forage Harvest Management</u>
512	<u>Forage & Biomass Planting</u>
430	<u>Pipeline-Irrigation</u>
516	<u>Pipeline-Livestock</u>
528	<u>Prescribed Grazing</u>
557	<u>Row Arrangement</u>
558	<u>Roof Runoff Structure</u>
560	<u>Access Road</u>
561	<u>Heavy Use Area Protection</u>
574	<u>Spring Development</u>
575	<u>Animal Trails & Walkways</u>
578	<u>Stream Crossing</u>
580	<u>Streambank & Shoreline Protection</u>
584	<u>Channel Bed Stabilization</u>
585	<u>Contour Stripcropping</u>
586	<u>Field Stripcropping</u>
590	<u>Nutrient Management</u>
595	<u>Integrated Pest Management</u>
600	<u>Terrace</u>
606	<u>Subsurface Drain</u>
612	<u>Tree & Shrub Establishment</u>
614	<u>Watering Facility</u>
620	<u>Underground Outlet</u>
634	<u>Waste Transfer</u>
635	<u>Vegetated Treatment Area</u>
638	<u>Water & Sediment Control Basin</u>
642	<u>Water Well</u>
657	<u>Wetland Restoration</u>
658	<u>Wetland Creation</u>
659	<u>Wetland Enhancement</u>
	<u>Scouting</u>



PRACTICE DEFINITIONS & OTHER IMPORTANT TERMINOLOGY

Practice Definition

Page Number

Access Control (472): the restriction of animals, people or vehicles from areas to improve and protect natural resources in the area

[2.24](#)

Access Road (560): a permanent or temporary structure that reduces erosion by providing a fixed entry point into fields and pastures for year-round access

[2.7](#)

AFO: see *Animal Feeding Operation*

Alternative Water Source: an alternative watering source to limit animal access in areas of environmental concern or where water supply is unable to meet demand; examples may include watering ramps, spring development, troughs, tanks and wells

[2.40](#)

Anaerobic Digester--Ambient Temperature (365): an unheated waste treatment impoundment that biologically treats waste as part of a waste management system

[2.17](#)

Anaerobic Digester--Controlled Temperature (366): a managed temperature waste treatment impoundment that biologically treats waste as part of a waste management system

[2.17](#)

Animal Feeding Operation (AFO): a lot or facility where animals have been, are or will be stabled, confined and fed or maintained for at least 45 days within a 12-month period and where vegetation, crops, and forage growth is not sustained over any part of the lot or facility in a normal growing season

[2.13](#)

Animal Mortality Facility (316): a permanent structure used to dispose of carcasses used as part of a waste management plan

[2.18](#)

Animal Trails and Walkways (575): the construction and maintenance of paths specifically for animal movement, especially in heavy traffic areas

[2.20](#)

Best Management Practice: a practice or combination of practices determined to be the most effective practical means of preventing or reducing the amount of pollution generated by nonpoint sources to a level compatible with water quality goals

[1.1](#)

CAFO: see *Concentrated Animal Feeding Operation*

Channel Bed Stabilization (584): method used to alter bed depth and sediment transport in order to stabilize or strengthen the bed or bottom of a channel

[2.80](#)

CNMP: see *Nutrient Management Plan*

Composting Facility (317): a facility used to dispose of carcasses and waste in a sanitary method that results in a usable soil additive by-product

[2.21](#)

Concentrated Animal Feeding Operation (CAFO): an animal feeding operation that has been identified by the federal government as a possible point source of pollution. CAFO identification is based on the type of animal production, the size of the individual operation or the amount of waste that is discharged from the site. CAFOs are subject to NPDES permitting under current regulations

[2.13](#)

Conservation Cover (327): the establishment and maintenance of permanent vegetative cover on retired agricultural land or highly erodible land

[2.55](#)

Conservation Tillage: a tillage planting system that maintains at least 30% residue cover on the soil surface after planting; three predominant types of conservation tillage include mulch tillage, no-tillage, and ridge tillage

[2.56](#)

Contour Buffer Strip (332): strips of permanent vegetation established on a field's contour to reduce erosion, slow sediment transport and reduce runoff

[2.59](#)

Contour Farming (330): a planting system of tilling, planting and performing farming operations on or near the contour of a field to reduce erosion and runoff

[2.58](#)

Contour Stripcropping (585): a planting system in which crops are grown in an alternating pattern with fallow strips of equal width to reduce soil erosion and water degradation

[2.59](#)

Cover Crop (340): the establishment of close-growing grasses, legumes and forages as a temporary cover to reduce soil erosion, capture and use excess nutrients, and improve soil quality

[2.60](#)

Critical Area Planting (342): the establishment of permanent vegetation or cover on highly erodible land in order to reduce soil erosion

[2.23](#)

Crop Rotation (328): a planting system in which crops are planted in recurring sequence to reduce soil erosion and runoff

[2.61](#)

Diversion (362): the establishment of permanently vegetated strips across a slope to slow water flow and redirect water to areas of need

[2.62](#)

Fence (382): barriers installed to limit animal, human and wildlife entry into specified areas and water sources

[2.24](#)

Field Border (386): permanently vegetated borders established around fields and pastures to reduce soil erosion

[2.63](#)

Field Stripcropping (586): a planting system in which crops are grown in alternating strips with grasses to reduce soil erosion and runoff

[2.64](#)

Filter Strip (393): strips of vegetation located between cropland, grazing land or disturbed areas and water sources to protect water quality

[2.65](#)

Forage & Biomass Planting (512): a management strategy that reduces soil erosion and improves water quality by establishing native or introduced forages for pasture, hay or biomass production

[2.8](#)

Forage Harvest Management (511): a management system designed to maximize yield and forage quality and to reduce erosion and water quality degradation by maintaining forage stand

[2.9](#)

Grade Stabilization Structure (410): structures that allow water to move from a higher elevation to a lower elevation while minimizing soil erosion

[2.67](#)

Grassed Waterway (412): natural or constructed grass channels established within a field to slow the flow of water, re-direct excess water from fields and to prevent soil erosion

[2.68](#)

Heavy Use Area Protection (561): the establishment of vegetation and/or the installation of erosion prevention materials to protect heavy traffic areas

[2.25](#)

Integrated Pest Management (595): a management plan that uses environmentally sensitive practices to control weeds, insects and disease on fields and pastures and reduce negative effects on humans, and soil and water quality

[2.69](#)

IPM: see *Integrated Pest Management*

Intermittent Stream: a stream, or portion of a stream, that flows only in direct response to precipitation. It receives little or no water from springs or groundwater and no long-continued supply from melting snow or other sources. It is dry for a large part of the year, ordinarily more than three months

[2.17](#)

Irrigation Land Leveling (464): the reshaping and grading of land to be irrigated to improve water usage

[2.27](#)

Irrigation Tailwater Recovery System (447): a water recovery system designed to collect, store and transport tailwater for reuse in an irrigation system

[2.44](#)

Irrigation Water Management (449): a management plan designed to efficiently use irrigation water by determining and controlling the rate, amount and timing of irrigation water

[2.45](#)

- Land Application System (LAS):** any waste utilization system in which animal manure is applied to land for beneficial use [2.13](#)
- Land Smoothing (466):** the removal of irregularities on land surfaces to improve surface drainage [2.27](#)
- Microirrigation (441):** a type of irrigation used to efficiently apply water to the root zone of plants using low-pressure emitters [2.46](#)
- Mulch Tillage (345):** a conservation tillage system in which residue is maintained on fields year-round and the entire field is tilled prior to planting [2.56](#)
- NMP:** See *Nutrient Management*
- No Tillage (329):** a conservation tillage system in which crops are grown on areas that have previously not been tilled [2.56](#)
- Nutrient Management (590):** a management plan that assists producers in improving management and nutrient use by matching needs more efficiently and reducing nutrients in runoff [2.28](#)
- Perennial Stream:** a watercourse that flows throughout a majority of the year in a well-defined channel [2.17](#)
- Pipeline (516/430):** a component of an alternative water system used to transport water for livestock or irrigation purposes [2.40/2.47](#)
- Pond (378):** an impoundment constructed to provide water for livestock, fish, wildlife, recreation, fire control and other uses [2.10](#)
- Prescribed Grazing (528):** a grazing system that promotes vegetative quality and quantity by managing grazing animals to promote stand longevity [2.30](#)
- Prime Farmland:** land that has soil with the best combination of physical and chemical characteristics for producing food and fiber on a sustained basis with proper management; soil is classified into capability classes based on limitations related to soil type and the need for conservation practices to reduce erosion potential [2.51](#)
- Ridge Tillage (346):** a conservation tillage system in which residue is maintained on fields year-round and crops are grown on pre-formed ridges that are alternated with furrows with residue [2.56](#)
- Riparian Forest Buffer (391):** the establishment of primarily trees and/or shrubs adjacent to water bodies to protect water quality, provide wildlife habitats and to stabilize stream banks and channels [2.81](#)

- Riparian Herbaceous Cover (390):** the establishment of grasses, grass-like plants and forbs adjacent to water bodies to protect water quality, provide wildlife habitats and to stabilize stream banks and channels [2.83](#)
- Roof Runoff Structure (558):** structures used to capture and transport water from roofs and to limit soil erosion resulting from roof runoff [2.12](#)
- Row Arrangement (557):** a system of planting crops on grades and lengths to slow water running from fields into surface ditches [2.58](#)
- Scouting:** the utilization of available research and thorough field investigation to determine when pests reach a sufficient threshold to require pesticide treatment [2.71](#)
- Sediment Basin (350):** an impoundment constructed to capture and store debris or sediment running off of fields or pastures [2.73](#)
- Sprinkler (442):** a method of water application that uses pressurized nozzles to apply water to irrigated acres [2.48](#)
- Spring Development (574):** the development of a spring or seep to improve the quality, quantity and distribution of water [2.40](#)
- Streambank and Shoreline Protection (580):** the stabilization and protection of streams, constructed channels and shorelines in order to reduce erosion and water degradation [2.84](#)
- Stream Crossing (578):** a structure that is designed to protect quality and reduce erosion by designating stable access points and crossings for livestock [2.31](#)
- Subsurface Drain (606):** an underground drain used to collect and remove excess water [2.49](#)
- Surface and Subsurface Irrigation (443):** a method of irrigation that is constructed to promote efficient irrigation water distribution [2.50](#)
- Terrace (600):** embankment or ridges constructed across field slopes to capture runoff water and convey it to stable outlets [2.75](#)
- Total Maximum Daily Load (TMDL):** a calculation of the maximum amount of a pollutant that a water body can receive and still meet water quality standards, and an allocation of that amount to the pollutant's sources [1.1](#)
- Tree/Shrub Establishment (612):** the establishment of trees and shrubs to slow runoff, provide additional time for nutrient absorption, and to provide long-term erosion control [2.86](#)

Underground Outlet (620): a component of a drainage system used to collect surface water and convey it to safe outlets

[2.77](#)

Vegetated Treatment Area (635): a strip of herbaceous cover used to reduce sediment and nutrient loadings as part of an agricultural waste management system

[2.33](#)

Waste Facility Closure (360): the closure of lagoons and waste storage ponds that are no longer used for their original purpose

[2.34](#)

Waste Facility Cover (367): a component of an animal waste management system used to maintain the capacity of and limit rainfall entering storage facilities to improve water and air quality

[2.35](#)

Waste Storage Facility (313): a storage facility constructed to temporarily store waste, wastewater and contaminated runoff as part of an agricultural waste management system

[2.36](#)

Waste Transfer (634): a manure transport system that utilizes a conveyance system to transport manure to storage facilities, loading areas or agricultural land

[2.38](#)

Waste Treatment Lagoon (359): a treatment facility constructed to biologically treat waste, wastewater and contaminated runoff as part of an agricultural waste management system

[2.39](#)

Watering Facility (614): an alternative watering source used to provide livestock and wildlife with a water supply where needed

[2.40](#)

Water and Sediment Control Basin (638): an impoundment constructed to temporarily capture runoff, trap sediment, reduce soil erosion and improve water quality

[2.76](#)

Water Well (642): a component of an alternative water supply used to provide water for irrigation, livestock, wildlife or recreation purposes

[2.40](#)

Wetland Creation (658): the establishment of a wetland on a site that has not historically been a wetland

[2.87](#)

Wetland Enhancement (659): the modification or rehabilitation of an existing wetland to improve the function and capacity of the wetland

[2.87](#)

Wetland Restoration (657): the restoration of a wetland that previously existed to restore the natural condition as much as possible

[2.87](#)