

**NATURAL RESOURCES CONSERVATION SERVICE  
CONSERVATION PRACTICE STANDARD**

**WASTE UTILIZATION  
(Acre)**

**CODE 633**

**DEFINITION**

Using agricultural wastes such as manure and wastewater or other organic residues.

**PURPOSES**

- Protect water quality
- Protect air quality
- Provide fertility for crop, forage, fiber production and forest products
- Improve or maintain soil structure
- Provide feedstock for livestock
- Provide a source of energy

**CONDITIONS WHERE PRACTICE APPLIES**

This practice applies where agricultural wastes including animal manure and contaminated water from livestock and poultry operations; solids and wastewater from municipal treatment plants; and agricultural processing residues are generated and/or utilized.

**CRITERIA**

**General Criteria Applicable to All Purposes**

All federal, state, and local laws, rules and regulations governing waste management, pollution abatement, health, and safety shall be strictly followed. The owner or operator shall be responsible for securing any and all required permits or approvals related to waste utilization, and for operating and maintaining any components in accordance with applicable laws and regulations.

The Alabama Department of Environmental Management (ADEM) Rules require owners/operators of animal feeding operations (AFO's) and associated waste management systems to fully implement and regularly maintain

effective best management practices (BMP's) that meet or exceed NRCS technical standards and guidelines to prevent discharges and to ensure groundwater and surface water quality.

If a non-toxic, non-hazardous industrial or treated municipal waste liquid/material is beneficially applied according to this standard in a manner that protects surface waters and groundwater, ADEM/EPA permit coverage is not required.

Use of agricultural wastes and organic by-products shall be based on at least one analysis of the material during the time it is to be used. In the case of daily spreading, the waste shall be sampled and analyzed at least once each year. As a minimum the waste analysis should identify nutrient and specific ion concentrations. Where the metal content of municipal wastewater, sludge, septage, and other agricultural waste is of a concern, the analysis shall also include determining the concentration of metals in the material.

When agricultural wastes are land applied, application rates shall be consistent with the requirements of the Alabama NRCS conservation practice standard Nutrient Management, Code 590.

Where agricultural wastes are to be spread on land not owned or controlled by the producer, the waste management plan, as a minimum, shall document the amount of waste to be transferred and who will be responsible for the environmentally acceptable use of the waste.

Records of the use of wastes shall be kept a minimum of five years as discussed in OPERATION AND MAINTENANCE, below.

**Additional Criteria to Protect Water Quality**

All agricultural wastes and organic by-products shall be utilized in a manner that minimizes the opportunity for contamination of surface and ground water supplies.

Evaluate each field, site, or farm for potential to impact water resources. The following shall be documented:

- Proximity of site to wells and streams
- Soil infiltration rates
- Soil ratings for leaching of soluble nutrients
- Proximity to known sinkholes
- Predominant slope of disposal site
- Type and quality of vegetative cover
- Distance to public roads
- Distance to neighboring residences

Evaluate water quality standards and designated use limitations that exist locally or statewide in managing nutrients to protect the quality of water resources.

Agricultural waste shall not be land-applied on soils that are frequently flooded, as defined by the National Cooperative Soil Survey, during the period when flooding is expected.

When liquid wastes are applied, the application rate shall not exceed the infiltration rate of the soil, and the amount of waste applied shall not exceed the moisture holding capacity of the soil profile at the time of application. Wastes shall not be applied to saturated, frozen or snow-covered ground.

An application distance from environmentally high risk areas such as streams, lakes, non-vegetated concentrated flow areas within the field, and public use areas shall be established or maintained along field edges to help reduce nutrients transported with sediment and runoff water. Table 1 provides general application distance recommendations. Site specific conditions may warrant larger or smaller application distances.

Erosion, runoff, and water management controls shall be installed, as needed, on fields that receive agricultural wastes and organic by-products.

#### **Additional Criteria to Protect Air Quality**

Incorporate surface applications of solid forms of manure or other organic by-products into the soil within 24 hours of application to minimize emissions and to reduce odors.

When applying liquid forms of manure with irrigation equipment select application conditions where there is high humidity, little/no wind blowing, a forthcoming rainfall event and/or other conditions that will minimize volatilization losses into the atmosphere. The basis for applying manure under these conditions shall be documented in the nutrient management plan.

Handle and apply poultry litter or other dry types of animal manure or other organic by-products when weather conditions are calm and there is less potential for blowing and emission of particulates in the atmosphere. The basis for applying manure under these conditions shall be documented in the nutrient management plan.

When sub-surface applied using an injection system, waste shall be placed at a depth and applied at a rate that minimizes leaks onto the soil surface while minimizing disturbance to the soil surface and plant community.

All materials shall be handled in a manner to minimize the generation of particulate matter, odors, and greenhouse gases.

#### **Additional Criteria for Providing Fertility for Crop, Forage, Fiber Production and Forest Products**

Where agricultural wastes and organic by-products are utilized to provide fertility for crop, forage, fiber production, and forest products, the Alabama NRCS conservation practice standard Nutrient Management, Code 590 shall be followed.

Where municipal wastewater and solids are applied to agricultural lands as a nutrient source, the amounts of heavy metals shall not exceed the limits listed in Table 2. The concentration of salts shall not exceed the level that will impair seed germination or plant growth.

Apply municipal and industrial sludge only to soils that are adjusted to pH 6.5 or greater and are to be managed at pH 6.2 or higher thereafter.

#### **Additional Criteria for Improving or Maintaining Soil Structure**

Wastes shall be applied at rates not to exceed the crop nutrient requirements or salt concentrations as stated above.

Residue management practices shall be used for maintenance of soil structure.

#### **Additional Criteria for Providing Feedstock for Livestock**

Agricultural wastes to be used for feedstock shall be handled in a manner to minimize contamination and preserve its feed value. To minimize risks from drug residues in the tissue of beef cattle that are fed poultry litter, all litter feeding should be discontinued 15 days before the animals are marketed for slaughter. A qualified animal nutritionist shall develop rations which utilize wastes.

Agricultural wastes shall not be fed to lactating dairy cows.

Poultry litter has potential hazards associated with pathogenic bacteria such as Salmonella, and residues from medicated poultry rations such as antibiotics, coccidiostats, copper, and arsenic. All litter, regardless of its source, shall be processed to eliminate pathogenic organisms and monitored to assure that residue concentrations are at safe levels.

### **Additional Criteria for Providing a Source of Energy**

Use of agricultural waste for energy production shall be an integral part of the overall waste management system.

All energy producing components of the system shall be included in the waste management plan and provisions for utilization of residues of energy production identified.

Where the residues of energy production are to be land-applied for crop nutrient use or soil conditioning, the criteria listed above shall apply.

### **CONSIDERATIONS**

The effect of waste utilization on the water budget should be considered, particularly where a shallow ground water table is present or in areas prone to runoff. Limit waste application to the volume of liquid that can be stored in the root zone.

Wastes applied to soils with less than 20 inches (50 cm) of depth to bedrock or to other root restricting layers pose a high risk for groundwater and subsurface flow contamination.

Minimize the impact of odors of land-applied wastes by making application when temperatures are cool and wind direction is not toward neighbors and other sensitive areas, avoiding weekends and holidays.

Agricultural wastes and other organic by-products that may contain pathogens and other disease-causing organisms should be utilized in a manner that minimizes their disease potential.

Priority areas for land application of wastes should be on gentle slopes located as far as possible from waterways, wells, and other sensitive areas. When wastes are applied on more sloping land or land adjacent to waterways, other conservation practices should be installed to reduce the potential for offsite transport of waste.

Consider the impact to the health and vigor of plants when surface applying waste to plant foliage.

It is preferable to apply wastes on pasture and hay land soon after cutting or grazing before re-growth has occurred.

Reduce nitrogen volatilization losses associated with the land application of some waste by incorporation within 24 hours.

Minimize environmental impact of land-applied waste by limiting the quantity of waste applied to the rates determined using the Alabama NRCS conservation practice standard Nutrient Management, Code 590 for all waste utilization.

Excessive levels of one nutrient in the soil may induce deficiencies of other micronutrients.

Consider the effects of soil erosion control practices used to reduce soil loss, runoff, transport, and leaching of dissolved and attached nutrients and elements.

Consider the net effect of waste utilization on greenhouse gas emissions and carbon sequestration.

### **PLANS AND SPECIFICATIONS**

Plans and specifications for waste utilization shall be in keeping with this standard and shall describe the requirements for applying the practice to achieve its intended purpose. The waste management plan is to account for the utilization or other disposal of all animal wastes and organic by-products produced, and all waste application areas shall be clearly indicated on a plan map.

### **OPERATION AND MAINTENANCE**

Minimize exposure to animal and organic wastes or manure gases. Wear protective clothing when appropriate.

Protect agricultural waste and organic by-product storage facilities from weather and accidental leakage or spillage that will result in undesirable effects on soil, water, and plants.

When cleaning equipment after waste application, remove wastes in an appropriate manner. If system is flushed, use rinse water in the following batch of wastewater, where possible, or dispose of it according to state and local regulations. Always avoid high runoff areas, ponds, lakes, streams, and other water bodies. Extreme care must be exercised to avoid contaminating wells.

Records shall be kept for a period of five years or longer, and include when appropriate:

- Quantity of manure and other agricultural waste produced and their nutrient content

- Analysis of agricultural waste and other organic by-products utilized, including their metal content if applicable
- Soil test results
- Dates and amounts of waste application where land applied, and the dates and amounts of waste removed from the system due to feeding, energy production, etc.
- Dates, amounts, and entities receiving material exported from the operation
- Waste application methods
- Describe climatic conditions during waste application such as time of day, temperature, humidity, wind speed, wind direction, and other factors as necessary
- Crops grown and yields (both yield goals and measured yield)
- Other tests, such as determining the nutrient content of the harvested product
- Calibration of application equipment

The operation and maintenance plan shall include the dates of periodic inspections and maintenance of equipment and facilities used in waste utilization. The plan should include what is to be inspected or maintained, and a general time frame for making necessary repairs.

## REFERENCES

ADEM Administrative Code, Chapter 335-6-7, as amended

[ADEM/NRCS Buffer Distance Summary for Animal Feeding Operations](#)

Alabama Cooperative Extension Service:  
Feeding Broiler Litter to Beef Cattle, Circular ANR-557, 2000

[Water Quality and Pollution Control Handbook, Circular ANR-790, 1995](#)

Alabama NRCS Conservation Practice Standards:  
[Filter Strip, Code 393](#)

[Nutrient Management, Code 590](#)

[Riparian Forest Buffer, Code 391A](#)

[National Cooperative Soil Survey](#)

[NRCS National Engineering Handbook, Part 651, Agricultural Waste Management Field Handbook](#)

[United States Environmental Protection Agency, Land Application of Sewage Sludge: A Guide for Land Appliers on the Requirements of Federal Standards for the Use or Disposal of Sewage Sludge, 40 CFR Part 503, 1993](#)

**Table 1. Recommended Application Distances For Animal Manure  
And Organic By-Product Application**

<u>Object, Site</u>	<u>Situation</u>	<u>Buffer width (ft.) from Object, Site</u>
Well	Located up-gradient of application site	200
Well	Located down-gradient of application site	300
Waterbody or Stream <sup>1/</sup>	Waste applied to pasture <sup>3/</sup> , hayland, or cultivated land <sup>4/</sup>	50 <sup>2/</sup>
Public Road	Spray irrigated wastewater	100
Public Road	Waste applied with spreader truck	50
Public Use Area <sup>5/</sup>	Dry waste	100
	Liquid waste	200
	Spray irrigated wastewater	500
Property Line	All	25

<sup>1/</sup> Waterbody includes pond, lake, wetland, or sinkhole. Stream includes both perennial and intermittent streams.

<sup>2/</sup> On edges of the application field where runoff occurs to environmentally sensitive areas and to non-vegetated concentrated flow areas within the field, application distances must include a vegetated filter at least 50 feet wide that is established to permanent grasses in accordance with Alabama NRCS conservation practice standard Filter Strip, Code 393, with a stem density of at least 1 per square inch. If the application distance includes a riparian forest buffer in accordance with Alabama NRCS conservation practice standard Riparian Forest Buffer, Code 391A, the permanent grass filter strip may be 20 feet wide. The vegetated width must be located adjacent to the application area in the field and be shaped so that flow from runoff is uniform (sheet flow) and does not concentrate.

<sup>3/</sup> If good grazing management (i.e. rotational grazing) is not used on pastureland, the vegetative filter must be protected from over grazing with a fence.

<sup>4/</sup> Cultivated land for waste application must have adequate erosion control practices in place.

<sup>5/</sup> Public use areas include such occupied locations as a non-owner dwelling, church, school, hospital, or park.

**TABLE 2. Land Application Pollutant Limits for Sewage Sludge<sup>1/</sup>**

<b>Metal</b>	<b>Ceiling Concentration Limits</b>	<b>Cumulative Pollutant Loading Rate Limits</b>	<b>Annual Pollutant Loading Rate Limit</b>
	(mg/kg) <sup>2/</sup>	(kg/ha) <sup>3,5/</sup>	(kg/ha/yr) <sup>4,5/</sup>
Arsenic	75	41	2
Cadmium	85	39	1.9
Copper	4300	1500	75
Lead	840	300	15
Mercury	57	17	0.85
Selenium	100	100	5
Zinc	7500	2800	140

<sup>1/</sup> From 40 CFR Part 503.

<sup>2/</sup> Dry weight basis; all sewage sludge samples (instantaneous values) must be below the ceiling concentration to be eligible for land application; applies to all sewage sludge that is land applied.

<sup>3/</sup> Bulk sewage sludge.

<sup>4/</sup> Applies only to sewage sludge sold or given away in a bag or other container (of 2,200 pounds or less) for application to the land.

<sup>5/</sup> To convert to lbs/ac multiply by 0.892.