

**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.
- 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 adhered to. 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.

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.

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 should be noted:

- 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.

Conservation practices are reviewed periodically, and updated if needed. To obtain the current version of this standard, contact the Natural Resources Conservation Service.

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

Surface applied dry animal manure, poultry litter, and other dry organic by-products will not be applied to soils which are subject to very frequent and frequent flooding as defined by the United States Department of Agriculture, Natural Resources Conservation Service (NRCS) National Soil Survey Handbook. This is more than a 50 percent chance of flooding in any year.

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.

Buffers according to NRCS Conservation Practice Standard (CPS) Filter Strip – Code 393 or Riparian Forest Buffer – Code 391A shall be established or maintained along field edges in environmentally high risk areas, such as fields adjacent to streams or lakes, to help reduce nutrients transported with sediment and runoff water. Table 1 provides general recommendations for buffer widths. Site specific conditions may warrant more or less buffer width.

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

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 NRCS CPS Nutrient Management - Code 590 shall be followed.

Where municipal wastewater and solids are applied to agricultural lands as a nutrient source, the annual application or lifetime limits of heavy metals shall not exceed the amounts 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, and shall be applied at times the waste material can be incorporated by appropriate means into the soil within 72 hours of application.

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.

Waste 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 NRCS CPS 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.

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:

- 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.
- 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

Alabama Cooperative Extension Service. 2000. Feeding broiler litter to beef cattle. Circular ANR-557.

Alabama Cooperative Extension Service. 1995. Water quality and pollution control handbook. Circular ANR-790.

United States Department of Agriculture, Natural

Resources Conservation Service. 1992. Agricultural waste management field handbook.

National Engineering Handbook, Part 651.

United States Department of Agriculture, Natural Resources Conservation Service. Conservation

practice standards

Filter Strip – Code 393

Nutrient Management – Code 590

Riparian Forest Buffer – Code 391A

United States Department of Agriculture, Natural

Resources Conservation Service. 1996. National soil survey handbook.

United States Environmental Protection Agency. 1993. The standards for the use or disposal of sewage sludge. 40 CFR Part 503.

**Table 1. Recommended Buffer Widths 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 ^{1/}	Waste applied to pasture ^{3/} , hayland, or cultivated land ^{4/}	50 ^{2/}
Public Road	Spray irrigated wastewater	100
Public Road	Waste applied with spreader truck	50
Public Use Area ^{5/}	Dry waste	100
	Liquid waste	200
	Spray irrigated wastewater	500
Property Line	All	25

^{1/} Waterbody includes pond, lake, wetland, or sinkhole. Stream includes both perennial and intermittent streams.

^{2/} On edges of the application field where runoff occurs to environmentally sensitive areas and to non-vegetated concentrated flow areas within the field, buffer widths must include a vegetated filter at least 50 feet wide that is established to permanent grasses (filter strip) with a stem density of at least 1 per square inch. If the filter incorporates a riparian forest buffer in accordance with 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 field or concentrated flow area and be shaped so that flow from runoff is uniform (sheet flow) and does not concentrate.

^{3/} 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.

^{4/} Cultivated land for waste application must have adequate erosion control practices in place.

^{5/} 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^{1/}

Metal	Ceiling Concentration Limits	Cumulative Pollutant Loading Rate Limits	Annual Pollutant Loading Rate Limit
	(mg/kg) ^{2/}	(kg/ha) ^{3,5/}	(kg/ha/yr) ^{4,5/}
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

^{1/} From 40 CFR Part 503.

^{2/} 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.

^{3/} Bulk sewage sludge.

^{4/} 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.

^{5/} To convert to lbs/ac multiply by 0.892.