NATURAL RESOURCES CONSERVATION SERVICE

CONSERVATION PRACTICE STANDARD

WASTE UTILIZATION

(Ac.)

CODE 633

DEFINITION

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

PURPOSE

- 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 met. The owner or operator shall be responsible for securing 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 shall be based on at least one analysis of the material (dry or liquid) during the time it is to be used or just prior to land application. As a minimum, the analysis should identify the amounts of moisture, nitrogen, phosphorus, and potassium. Other elements or components of the waste material may be analyzed as needed. In the case of spreading solid or semi-solid manure, the waste shall be sampled and analyzed at least once each year. Waste water effluent shall be tested prior to land application. Refer to the Oklahoma NRCS job sheets JS 633 01 and JS 633 02 for guidance on sampling dry and liquid manure.

The role of monitoring land application of sewage or municipal sludge in Oklahoma is with the Department of Environmental Quality (DEQ). DEQ should be contacted for planning and land application of municipal sludge or waste.

When agricultural wastes are land applied, application rates shall be consistent with the requirements of the Oklahoma NRCS Nutrient Management (590) standard.

Where agricultural wastes are land applied on land not owned or controlled by the producer, the nutrient management plan, as a minimum, shall document the amount of waste to be transferred. Refer to the Oklahoma NRCS Manure Transfer (634) standard for additional guidance.

Records of the use of wastes shall be kept a minimum of five years.

Additional Criteria to Protect Water Quality

All agricultural waste shall be utilized in a manner that minimizes the opportunity for contamination of surface and ground water supplies. Refer to the Oklahoma NRCS Nutrient Management (590) standard for guidance on land application of manure and organic by-products.

Additional Criteria to Protect Air Quality

Incorporate surface applications, where tillage is possible, 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 to no wind blowing, and/or other conditions that will minimize volatilization losses into the atmosphere.

Handle and apply poultry litter or other dry types of animal manure or other organic by-products when weather conditions are as such there is less potential for blowing and emission of particulates in the atmosphere.

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. Refer to the Oklahoma NRCS Atmospheric Resource Quality Management (370) standard for additional guidance.

The basis for applying manure under these conditions shall be documented in the nutrient management plan.

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

Where agricultural wastes are utilized to provide fertility for crop, forage, fiber production and forest products, the Oklahoma NRCS Nutrient Management (590) standard shall be followed.

When the use of waste water effluent is planned, nutrient values and salinity shall be determined by laboratory analysis on the effluent water prior to application to avoid potential crop damage.

A soil salinity analysis shall be performed when waste water effluent has been applied on an area for 3 years. The area shall be monitored for salinity accumulation using soil salinity test analysis on an annual basis as long as effluent is being applied.

Oklahoma Technical Note OK-17 will be used as guidance for plant tolerances to soil and irrigation water salinity. Waste water effluent will be applied in accordance with guidance in the Oklahoma Technical Note OK-17. The Oklahoma NRCS Irrigation Water Management (449) standard will be used to provide guidance for all other aspects of irrigation (soil intake/infiltration rate in/hr, dates, etc.).

Additional Criteria for Improving or Maintaining Soil Structure

Wastes shall be applied in such a manner as not to degrade the soil's structure, chemical properties, or biological conditions.

Incorporate surface applications, where tillage is possible, of solid forms of manure or other organic by-products into the soil within 24 hours of application to minimize nutrient losses**.**

Avoid applying materials that will not decompose in the soil.

High salt concentrations in the soil will cause soil particles to disperse and deteriorate soil structure. Soil salinity testing to monitor soil salt accumulation is recommended when large quantities of manure or organic by-products are being applied annually. This salinity analysis can be done in conjunction with routine soil testing every 3 years.

A soil salinity analysis shall be performed when waste water effluent has been applied on an area for 3 years. The area shall be monitored for salinity accumulation annually using a soil salinity test analysis as long as effluent is being applied.

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

Refer to the Oklahoma NRCS Nutrient Management (590) standard for additional guidance.

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.

Poultry litter stored for this purpose shall be covered. A qualified animal nutritionist shall develop rations that utilize wastes. Refer to the Oklahoma NRCS Feed Management (592) standard for additional guidance.

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.

Minimize the impact of odors of land-applied wastes by making application at times when temperatures are cool and when wind direction is away from neighbors.

Agricultural wastes contain pathogens and other disease-causing organisms. Wastes 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. 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. The Oklahoma NRCS Nutrient Management (590) standard provides guidance for determining land application sites and rates for animal wastes.

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

Consider the net effect of waste utilization on greenhouse gas emissions and carbon sequestration. Refer to the Oklahoma NRCS Atmospheric Resource Quality Management (370) standard for additional guidance.

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 produced, and all waste application areas shall be clearly indicated on a plan map.

OPERATION AND MAINTENANCE

It is the responsibility of the producer or the agent of the producer to maintain records which document the implementation of the waste utilization. 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.
- 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 or export from the operation.
- Describe climatic conditions during waste application such as: time of day, temperature, humidity, wind speed, wind direction and other factors as necessary.
- 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.