

**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.

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 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 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 waste shall be utilized in a manner that minimizes the opportunity for contamination of surface and ground water supplies.

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 frozen, snow-covered or saturated soil if the potential risk for runoff exists. The basis for the decision to apply waste under these conditions shall be

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documented in the waste management plan.

Location. Waste shall not be applied at locations:

- where the watertable is within 24 inches of the surface;
- within the 25 year flood plain of surface water courses;
- where bedrock is within 20 inches (50cm) of the surface;
- where land slope exceeds 15 percent;
- where water erosion rates exceed tolerable soil loss rates, (T) and;
- where waste application will worsen existing saline or sodic soil problems.

Management. When the waste is injected in clean water such as a sprinkler irrigation system, the system shall be separated from the waste source by an air gap or be equipped with a pressure sensitive backflow prevention device. Surface irrigation systems shall have tail water recovery pits or shall be otherwise operated to prevent contaminated runoff from leaving the field.

Waste applied within 200 feet (60m) upslope of any waterbody shall be injected or incorporated within 24 hours.

Liquid waste applied on slopes greater than 5 percent (9% if the waste contains more than 15 percent solids) without permanent vegetation:

- shall be injected or incorporated within 24 hours, or
- shall be applied in conjunction with soil and water conservation practices that minimize lateral movement of nutrients and organic matter from the point of application.

Timing. Applications shall be scheduled to assure:

- The nutrients in the waste are available to the vegetation during the growing season;
- Minimal leaching of nitrogen, or other undesirable contaminants, below the root zone, to the extent feasible, and;
- Minimal contamination of surface waters caused by runoff from the application area.

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 practice standard Code 590, Nutrient Management shall be applied. A Colorado Phosphorus Index Risk Assessment is also required.

Where municipal wastewater and solids are applied to agricultural lands as a nutrient source, the single application or lifetime limits of heavy metals shall not be exceeded. The concentration of salts shall not exceed the level that will impair seed germination or plant growth.

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. Chicken litter stored for this purpose shall be covered. A qualified animal nutritionist shall develop rations that utilize wastes.

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.

Concerns for odor control will exist when waste is applied near farm enterprises that do not cause odors, or near rural neighbors who earn their living off-farm. Significant odor concerns exist when waste is applied near urban areas or rural subdivisions. In these cases the following are alternatives that may minimize the impacts of odors from waste application:

- Apply waste at other locations;
- Inject liquids or incorporate solid waste with tillage immediately;
- Restrict spreading to times when winds are minimal or in a direction that won't carry odors to neighbors;
- Avoid applications when people are home and typically outdoors, (weekends, holidays, warm summer days);
- Apply waste in thin layers that will dry quickly;
- Spread waste within 4 days of excretion if possible;
- Treat waste prior to application in lagoons or by composting;
- Avoid spreading near highways or other highly visible locations, or;
- Keep waste hauling and application vehicles covered during transport and as clean as possible to avoid leaving waste on roadways and to present a positive image of the operation.

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

Consider rotating waste applications among several fields instead of continuous applications on the same field to avoid or lessen the opportunity for negative impacts from waste disposal practices.

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.

It is preferable to apply wastes on pastures and hayland soon after cutting or grazing before re-growth has occurred. Nitrates may accumulate in some forage crops. Consider animal health when developing waste application plans for grazing lands. Grazing should be prohibited for a period of at least 60 days after waste application to minimize the opportunity for parasite transmission.

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 Colorado practice standard Nutrient Management (590) for all waste utilization.

Soil nitrogen levels may influence sugar production and fruiting in vegetable and fruit crops. To avoid impacting the quality of these crops consider avoiding waste application, or otherwise carefully managing soil nitrogen during the year(s) fruit, berry and other sugar producing crops are grown.

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

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;
- 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, and;
- 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

Best Management Practices for Manure Utilization, Bulletin #XCM-174, Colorado State University Cooperative Extension Service.

Biosolids Regulation, 4.9.0 (5 CCR 1002-19), Colorado Department of Public Health and Environment, Water Quality Control Commission.

Colorado Chemigation Act, Section 35, 11-101 CRS (Sup. 1990), Colorado Department of Agriculture.

Confined Animal Feeding Control Regulation, 8.1.0 (5 CCR 10002-5), Colorado Department of Public Health and Environment, Water Quality Control Commission.

Control of Manure Odors, ASAE Engineering Practice Standard EP379.1, ASAE (formerly American Society of Agricultural Engineers).

How to Sample Manure for Nutrient Analysis, NCR Extension Publication #567, North Central Region Extension Publications, Cooperative Extension Service.

NRCS Agricultural Waste Management Field Handbook, Chapter 11 - Waste Utilization, Chapter 12 - Waste Management Equipment, and Chapter 13 - Operation, Maintenance and Safety.

Soil Sampling: the key to a quality fertilizer recommendations, Service in action bulletin no. 0.500, Colorado State University Cooperative Extension Service.

Use of manure in crop production, Service in action bulletin # 549, Colorado State University Cooperative Extension Service.

Utilization of Animal Manure as Fertilizer, Bulletin #XCM-174, Colorado State University Cooperative Extension Service.

Colorado Agronomy Technical Note No. 95. Colorado Phosphorus Index Risk Assessment, 2002. USDA Natural Resources Conservation Service. Lakewood, CO.

Colorado Conservation Practice Standard Code 590, Nutrient Management, 2000. USDA Natural Resources Conservation Service. Lakewood, CO.