

WASTE UTILIZATION (ACRE)

Definition

Using agricultural waste or other waste on land in an environmentally acceptable manner while maintaining or improving soil and plant resources.

Scope

This standard establishes the minimum acceptable requirements for waste utilization. It does not apply to the design and installation of other waste management system components. This practice should be included in a waste management system (Code 312) plan prior to its establishment.

Purpose

To safely use wastes to provide fertility for crop, forage, or fiber production; to improve or maintain soil structure; to prevent erosion; and to safeguard water resources.

Conditions Where Practice Applies

This practice applies where:

1. Soil, water, and plant resources are suitable for the use of waste as a nutrient source.
2. Waste is generated from agricultural production and processing, municipal treatment plants, septage, and industrial plants.

Planning Considerations

Waste and soil physical, chemical and biological characteristics should be considered to protect environmental resources. Items such as, crops to be grown, cropping rotations, nutrient utilization, waste amount, land availability, application method, time of application, acreage, weather conditions, labor and equipment need to be considered.

Waste utilization should consider the existing and changing trend of land use in order to preserve local human resources and quality of life. Considerations should include proximity to housing unit(s), prevailing wind direction, odor control, noise control and visual aesthetics.

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Plans should include water quality effects from soil erosion and movement of sediment, pathogens, and soluble and sediment attached substances carried by runoff. The effects on the use and management of nutrients and organics and their effect on surface and ground water quality, especially for water supply to humans and livestock need considerations.

Adequate drainage, erosion control, and other soil and water management practices shall be considered to assure proper waste utilization.

OPERATIONS, SAFETY, AND MAINTENANCE

To safely operate and maintain this practice, the operator must:

1. Minimize exposure to animal and organic waste and manure gases, especially in closed areas such as covered pits. Wear protective clothing or respirators rated for gases encountered when and where appropriate.
2. Calibrate application equipment to ensure accuracy and uniformity of waste application. Regular inspection and maintenance of equipment should be done according to manufacturer's recommendations.
3. Keep good records of waste being utilized in each field. Record and document the chemical and biological constituents of the waste and soil that were determined in the analyses. Record the quantity of waste applied, timing of application, and crop produced for each field.
4. Periodically analyze waste and soils to monitor nutrient and heavy metal levels, and soil pH.
5. Avoid environmental degradation by cleaning waste handling equipment and apply wastes away from runoff areas, water bodies, wellheads, and sinkholes.
6. Use waste handling equipment in a safe manner. Follow all manufacturer's recommendations for safe operation. Special precaution is needed around waste storage facilities.
7. Revise the Waste Management System plan if changes to the farm operation concerning acreage, crop rotation, waste generation, and utilization occur.

DESIGN CRITERIA

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All wastes must be applied in accordance with Nutrient Management (590) and/or Waste Management System (312) standards and specifications. Apply waste by a method to best meet the objectives of the nutrient management plan or waste management system plan.

Analyze waste and soil. The analysis of soil must include pH, calcium, magnesium, phosphorus, and potassium. The analysis of manure must include total nitrogen, ammonium nitrogen, phosphate, potash, calcium, and magnesium.

For soils testing low or medium in phosphate, animal wastes can be applied to satisfy crop nitrogen requirements

Monitor phosphate levels annually if high or very high levels are noted in soil tests. When phosphorus levels are high or very high, animal waste application rates should be based on crop removal rate for phosphorus. If this is not feasible, the "Phosphorus Index for Nutrient Management" will be used to determine appropriate action to minimize Phosphorus loss from each field.

On these fields where animal wastes are applied, special practices must be installed to reduce excessive runoff, erosion and nutrient losses. On permanent pasture soils that test high or very high in potassium, animal waste application rates should not exceed crop removal rates for potassium in order to minimize potential for grass tetany.

Apply waste at the best time to maximize nutrient utilization and minimize losses. Nutrients are more available when waste is applied within one week of planting or the period of maximum growth of perennial plants. Nutrient losses will be minimized by avoiding application of manure on frozen soil, snow, and during periods of high runoff.

The following provisions must be followed to control erosion and runoff, and minimize nutrient losses:

1. Maintain a vigorous stand of vegetation in grassed waterways (90% cover).
2. Wastes will be applied so as to restrict pollution of ponds, streams, lakes, wells, and sinkholes. For lands subject to flooding, wastes will be applied and utilized during periods when flooding is unlikely.
3. Wastes will not be spread in a waterway or other areas where water may concentrate.

4. Inject or incorporate waste on the contour of the land where tillage, topography, and soil depth permit.

Commercial fertilizers may be used to supplement nutrients applied in the waste material to supply the difference between crop needs and that applied in wastes. Refer to Nutrient Management Code 590.

When utilizing wastes on forage crops:

1. Avoid high nitrogen application to forage stands with legumes that would overstimulate weed and grass growth and make the legume less competitive.
2. Apply to forage stands with legumes when the legume has become depleted (less than 15% of the stand.)

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 such laws and regulations.

SPECIFICATIONS

Establishment - To establish this practice, the operator must:

1. Develop Waste Management System plan (312).

Included in this step are the following actions:

- a. Analyze waste and soils using WVU or a certified lab.
- b. Determine application sites, acreage, soil type, soil texture and resource conditions.
- c. Determine livestock numbers, type, and manure production.
- d. Determine type of equipment, application method, time and labor.
- e. Determine crop, crop nutrient needs, application rates, and schedule of application.

- f. Determine special practice needs for reducing nutrient losses, erosion control, water quality protection, and odor control.

2. Apply and utilize wastes and supplemental commercial fertilizers according to the Nutrient Management Plan (590).

3. Follow local, state and federal regulations pertaining to waste utilization.

REFERENCES

- 1 . Agricultural Waste Management Field Manual, USDA, Soil Conservation Service.

2. Agronomy Guide, Penn State University, Current.

3. Livestock Manure - What's It Worth? USDA, Soil Conservation Service, Morgantown, West Virginia, September 1990.

4. Soil Testing and Soil Fertility Manual, West Virginia University Extension Service, July 1990.

5. D.K. Bhumbra, R. Heaslip and E. Rayburn. 1997. "Phosphorous Index for Nutrient Management." USDA-NRCS and W.V. University, Morgantown, West Virginia.