

NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD

AMENDMENTS FOR TREATMENT OF AGRICULTURAL WASTE

(AU)

CODE 591

DEFINITION

The use of chemical or biological additives to change the properties of manure, process wastewater, contaminated storm water runoff and other wastes.

PURPOSE

- Facilitate the management, handling and processing of manure and waste
- Reducing risk associated with the spread and contamination from pathogens
- Improve or protect air quality
- Improve or protect water quality
- Improve or protect animal health

CONDITIONS WHERE PRACTICE APPLIES

This practice applies where the use of a chemical or biological amendment will alter the physical and chemical characteristics of the waste stream as a part of a planned waste management system. This practice does not include amendments added to the animal feed.

CRITERIA

General Criteria Applicable To All Purposes

Laws, Rules, and Regulations. Use of amendments as a part of a waste management system shall be planned and implemented to meet all Federal, state, and local laws, rules, and regulations.

Labeling and Instructions for Use. The label or accompanying for the use of the amendments contain the following information:

- Active ingredients and their percentage of the whole. Proprietary terminology may be used as long as the actual chemical and/or biological names are included.
- The purpose(s) for which the amendment is intended.

- Recommended application rate(s) to achieve the intended purpose(s).
- Application timing and methodology to optimize the effectiveness of the amendment.
- Incorporation requirements (if any).
- Special handling and storage requirements for the amendment.
- Any safety concerns relating to the use of the amendment and recommended measures to overcome the safety concern, including any required personal protective equipment.

Validation of Product. It is the responsibility of the amendment provider to furnish the following documentation to the NRCS:

- The species-specific rate, timing, and application methodology of an amendment to achieve a needed level of treatment addressing a specific purpose must be documented by a university or other independent research entity acceptable to the NRCS.
- Documentation from peer reviewed journals is preferable. The effectiveness of the amendment under different climatic factors shall be included in the documentation, or if there are no differences in effectiveness, the documentation shall so state.
- Potential adverse impacts of the amendment on the ecosystem shall also be identified in the documentation.

If available document the effectiveness of the amendment under different climatic factors.

System Effects. Limit the use of amendments to situations where adverse impacts on other aspects of the planned manure management system have been addressed in the system design.

Land application of treated manure and other waste must meet the criteria in NRCS Conservation Practice Standard 590, Nutrient Management.

Storage and Transfer of Treated Wastes. Waste stream flow to or from a waste storage facility used in the amendment treatment process shall meet the requirements of the Arkansas NRCS Field Office Technical Guide (FOTG) Section IV, Practice Standard 634, Waste Transfer.

Manure/litter stored outside must be protected from rainfall.

Adequate storage shall be provided for manure/litter or manure/litter derivatives

following amendment treatment unless they are transported directly to the final utilization location.

Manure/litter transferred off farm and stored before being land applied must be protected from rainfall.

Nutrient Management Plans. Amendments will alter the characteristics of the litter or manure. The nutrient management plan shall account for the predicted effects of the amendment.

Phosphorous Binding. At a minimum, amendments used to bind phosphorous must be applied at the rate that the manufacturer predicts to be effective at ammonia suppression, or at a rate that will cause a reduction of soluble phosphorous by at least 25%, whichever rate is greater.

CONSIDERATIONS

The use of amendments to reduce ammonia and other emissions from manure in confined spaces may allow altered ventilation strategies at an appreciable energy savings.

Nutrient management plans may need to be revised for the reduction of ammonia emissions as this will also increase the proportion of nitrogen in the manure.

The use of an amendment may alter the composition of the waste stream. The use of amendments should be limited to situations where impacts of the altered waste stream on other aspects of the planned system have been identified.

Some amendments have been shown to affect multiple purposes of this standard and other aspects of a livestock production operation. Preference should be given to amendments with the greatest environmental and economic benefit.

The animal waste should be periodically tested to determine the actual effects of the amendment on the nutrient content and nutrient availability.

The reduction of ammonia emissions will also increase the proportion of nitrogen in the manure.

PLANS AND SPECIFICATIONS

Prepare plans and specifications in accordance with the criteria of this standard and describe the specific purposes for applying the practice, and the requirements for applying the practice to achieve these purposes.

Specifications for the use of an individual amendment will be developed in accordance with the label directions and other instructions provided by the vendor.

As a minimum, the plans and specifications shall provide the following:

- The name of the amendment, the purpose(s) for its use, and the planned outcome(s).
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- Application methodology, including rates, timing, mixing instructions, temperature requirements, etc.
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- Required tests to determine the effectiveness of the amendment as appropriate.

OPERATION AND MAINTENANCE

A site-specific operation and maintenance (O&M) plan shall be developed and reviewed with the operator and owner prior to implementation of the practice.

The O&M plan shall be consistent with the purposes of the practice, safety considerations, and label directions and other instructions provided by the vendor.

The O&M plan shall provide sufficient detail as to amendments to be used, application rates and timing, and equipment to be used.

The O&M plan shall detail all safety precautions necessary when handling the specific chemicals or biological amendments to be used.

The O&M plan shall provide for record keeping in sufficient detail to describe the amendment's use, actual application rates and timing, and any tests performed (including nutrient analysis).

Recommend a record keeping outline for the operator to document results and fine tune the manure treatment processes for their operation.

REFERENCES

USDA, NRCS national Engineering Handbook, Part 651, Agricultural Waste Management Field Handbook

USDA, NRCS Conservation Practice Standards, Code 590 Nutrient Management.

USDA, NRCS Conservation Practice Standard, Code 634, Waste Transfer.

Moore, P. A., Jr., and Miller, D. M. Decreasing Phosphorus Solubility in Poultry Litter with Aluminum, Calcium, and Iron Amendments. J. Environ. Qual. 23:325-330. 1994.

Moore, P. A., Jr., Daniel, T. C., Edwards, D. R. and Miller, D. M. Effect of Chemical Amendments on Ammonia Volatilization from Poultry Litter. J. Environ. Qual. 24:293-300. 1995.

Sharpley, A. N., Moore, P. A., Jr., Van Devender, K., Daniels, M., Delp, W., Daniel, T. and Baber, A. Arkansas Phosphorus Index. University of Arkansas Factsheet FSA9531. http://www.uaex.edu/Other_Areas/publications/PDF/FSA-9531.pdf. 2009. (Fact Sheet)