

**NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD**

**AMENDMENTS FOR TREATMENT OF AGRICULTURAL WASTE
(AU)**

CODE 591

DEFINITION

Treatment of manure, process wastewater, storm water runoff from lots or other high intensity areas, and other wastes, with chemical or biological additives

PURPOSE

To alter the physical and/or chemical characteristics of the waste stream to facilitate the implementation of a waste management system to:

- Improve or protect air quality
- Improve or protect water quality
- Improve or protect animal health
- Alter the consistency of the waste stream to facilitate implementation of a waste management system

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. Products to be used as manure amendments shall be

labeled or accompanied by instructions containing the following information as a minimum:

- 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. 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 difference in effectiveness, the documentation shall so state. Potential adverse impacts of the amendment on the ecosystem shall also be identified in the documentation. It shall be the responsibility of the amendment

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provider to furnish the documentation to the NRCS.

Apply amendments to the poultry litter remaining in the house after the removal of a flock or just prior to a total clean out. Growers shall adhere to their company's policies regarding the addition of amendments to the litter within the poultry houses, especially between flocks. Some amendments may be applied in dry or liquid form. For application of dry amendments, "de-cake" or till the litter with a rotary tiller before application of the amendment. Thoroughly incorporate amendment into the litter before introducing the next flock to prevent direct exposure to young birds.

APPLICATION RATE CRITERIA

FOR APPLYING ALUMINUM SULFATE

Treat litter with aluminum sulfate to reduce soluble P in runoff according to the following formula:

Pounds aluminum sulfate per bird = Soluble P reduction (%) / 375.

Example calculation:

For a 50% reduction in soluble P in runoff:

Pounds of aluminum sulfate per bird = $50 / 375 = 0.133$.

For a 20,000 bird house, to reduce the soluble P in runoff by 50%, the amount of aluminum sulfate required is determined as follows:

$20,000 \text{ birds} \times 0.133 \text{ lbs per bird} = 2667 \text{ lbs of aluminum sulfate.}$

Liquid alum may be used in place of dry alum. There are two forms of liquid alum - normal liquid and acid liquid alum. To achieve equivalent results of one ton of dry alum use the following conversions; apply 370 gallons of normal liquid alum or 512 gallons of acid liquid alum. (Note: Liquid alum is corrosive. Use caution and strict adherence to manufacturer's recommendations when using or handling liquid alum.)

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FOR APPLYING OTHER AMENDMENTS

In the absence of manufacture's recommended application rates, the treatment rate shall be on a weight per weight (w/w) ratio bases and shall be 10 % w/w. For example, the treatment of one ton of litter requires 200 pounds of amendment ($2000 \text{ lbs} \times 0.10$).

CONSIDERATIONS

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 use of amendments to reduce ammonia and other emissions from manure in confined spaces may allow altered ventilation strategies at an appreciable energy savings. The reduction of ammonia emissions will also increase the proportion of nitrogen in the manure.

Spot treatment may be warranted in areas where the litter moisture becomes higher due to water spills or leaks.

PLANS AND SPECIFICATIONS

Plans and specifications shall be prepared in accordance with the criteria of this standard and shall describe the requirements for applying the practice to achieve its intended purpose(s). 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).

- Application methodology, including rates, timing, mixing instructions, temperature requirements, etc.
- 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)

REFERENCES

Moore, P.A., Jr., T.C. Daniel, D.R. Edwards, and D.M. Miller. 1996. Evaluation of chemical amendments to reduce ammonia volatilization from poultry litter. *Poultry Science* 75: 315-320.

Moore, P.A., Jr., T.C. Daniel, D.R. Edwards. 1999. Reducing phosphorus runoff and improving poultry production with alum. *Poultry Science* 78: 692-698.

Tasistro, A.S., and D.E. Kissel. Amendments for the reduction of water soluble phosphorus in broiler litter. University of Georgia. Soil, Plant, and Water Laboratory. Athens, GA.

Walker, F., and R. Burns. Treating Broiler Litter with Alum. University of Tennessee. Agricultural Extension Service. P&SS info #318. Knoxville, TN