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Treating Poultry Litter With Alum

Dr. Philip A. Moore, Jr.
Soil Scientist, USDA-ARS

Dr. Susan Watkins
Professor and
Extension Poultry
Specialist

What Is Alum?

Alum or aluminum sulfate is an acid that is commonly used as a poultry litter treatment under the brand name Al^{+}Clear. It is available in either a dry or liquid form.

What Benefits Can I Expect From Using Alum?

- *Reduced ammonia levels in the house* (makes it safer for both farm workers and the birds).
- *Reduced pathogen levels in litter and on birds* (improving bird health and food safety).
- *Improved bird performance* (due to less ammonia and fewer pathogens).
- *Reduced propane use* (less ventilation required in cooler months).
- *Higher forage yields* (due to increased nitrogen content of the litter).
- *Reduced phosphorus runoff* (binds phosphorus in manure to reduce pollution).

How Much Alum Do I Apply to My House?

Alum is normally applied at a rate of 5 to 10 percent by weight of the litter. On average, a 4-pound broiler produces roughly 2 pounds of manure, so a typical 16,000-ft^2 house with 20,000 broilers would produce about 40,000 pounds of litter or 20 tons per flock. In order to add 10 percent alum by weight, 2 tons of alum would be added between each flock; 1 ton for 5 percent by weight. These rates are equivalent to 125 and 250 lbs/1,000 ft^2 for the 5 and 10 percent rate, respectively.

The greater the alum application rate, the greater the phosphorus binding and ammonia control benefits. The low rate (1 ton/house) will control ammonia for about half the time of the high rate. The depth and age of the litter will also play a role in the effectiveness of alum to control ammonia release. However, if the grower's intention is to control ammonia only during the brooding phase in order to save on heating costs (i.e., control ammonia for the first week), then he/she normally applies alum at rates of 75 to 100 lbs/1,000 ft^2. The lower rate of alum will not control phosphorus runoff as well as the higher rates because of the limited amount of alum available to bind the phosphorus.

While poultry growers often use lower rates of alum, it should be noted that USDA-NRCS cost sharing is only available for growers using the 5 to 10 percent rate of alum (125 to 250 lbs/1,000 ft^2). This is because the goal of the NRCS cost-sharing program is to provide growers with maximum phosphorus-binding capacity to help minimize nutrient runoff once the litter is land applied.

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How Do I Apply Alum?

Dry alum can be applied with a number of different spreaders, such as de-caking machines, fertilizer spreaders, manure trucks or drop spreaders. After de-caking the house, alum is typically broadcast applied to the litter. To ensure the chickens do not consume the granules of alum, it is best to till the product into the litter. Also, alum works best when it has been stirred into the litter. This can be done with a litter de-caker or with any other device that physically mixes the alum into the litter. Liquid alum is normally only applied by a certified professional applicator.

There are two types of liquid alum – normal liquid alum (48.5% alum) and acid alum (36.5% alum). The liquid acid alum, which is sold under the trade name of Al^{+}Clear-A7®, is preferred in situations where the litter is very dry since it activates quickly. Many growers also prefer liquid alum because a contractor normally applies it, freeing the grower from this additional chore. To add the equivalent of one ton of dry alum, 370 gallons of normal liquid alum would be needed or 512 gallons of liquid acid alum. Liquid alum would be preferred in those areas that are near a liquid alum plant. In Arkansas there are two liquid alum plants: one in Ashdown (SW Arkansas) and one in Pine Bluff (SE Arkansas).

Safety Tips and Precautions

As mentioned earlier, alum controls ammonia emissions by acidifying the litter. Like all acids, it should be treated with the proper respect. Applicators should always wear goggles for eye protection and a dust mask to avoid breathing alum dust, particularly if a spreader is used that broadcasts the material. Gloves should also be worn when handling alum to prevent skin irritation. The acid in alum will be neutralized in the litter after two to four weeks depending on application rate. Thus there are no precautions needed for handling the litter at cleanout. Minimize exposure of equipment and footings to alum since acids are corrosive to metal surfaces. Growers should also be aware that application of alum to the litter does not mean that ventilation can be completely stopped. Since birds generate a great deal of moisture throughout the life of the flock, it is essential that producers provide the required minimum ventilation from day one so that moisture buildup in the house is prevented.

How Much Does Alum Cost?

The cost of alum can vary greatly depending on if it is liquid or dry alum and how far the farm is from an alum plant. When dry alum is purchased in bulk from the manufacturer (General Chemical Corporation), then the price will be less than when the alum is purchased in 50-pound bags. Liquid alum can be much cheaper if the grower is near a liquid alum plant. To check on prices of alum, contact personnel from General Chemical at 1-800-631-8050. Cost sharing for alum is provided by USDA-NRCS in some states. Check with your county NRCS representative to see if this is available.

Summary

Treating poultry litter with alum will improve poultry production by decreasing ammonia emissions and will protect water quality by reducing phosphorus runoff. Controlling ammonia also makes the poultry house a safer working environment for the grower. Alum should be applied at rates of 1 to 2 tons/house/flock. Growers should wear gloves, goggles and a dust mask when applying alum. Cost sharing for alum is available in some states from USDA-NRCS.

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DR. PHILIP A. MOORE, JR. is a soil scientist with USDA-ARS, located at the University of Arkansas, Fayetteville. **DR. SUSAN WATKINS** is a professor and Extension poultry specialist with the University of Arkansas Division of Agriculture, located at the University of Arkansas, Fayetteville.

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