

## **Amendments: Their Role and Use**

Bud Malone  
Extension Poultry Specialist  
Department of Animal and Food Sciences  
University of Delaware  
Georgetown, DE 19947

The use of litter treatments has become an important tool in the management of built-up litter. Because litter treatments cover a broad range of products and functions, the following discussion is limited to those whose primary function is controlling ammonia volatilization from poultry litter. The deleterious effects of ammonia on broiler performance, bird health, carcass quality and plant condemnations have been well documented. Recent estimates suggest rearing broilers in 50 ppm ammonia versus 25 ppm can cost an additional \$75 per 1000 birds.

The need for ammonia control products evolved as the poultry industry shifted from the practice of complete bedding replacement after each flock to built-up litter programs. During the late 1970's with decreased ventilation rates and confinement brooding programs were used to conserve energy, the need for more effective ammonia control products intensified. Several commercial products emerged during the 1980's to meet this growing demand. Originally these products were used primarily in the brood chamber during cool weather and were most beneficial with marginal housing and poor management. Over time the use of these products has expanded to address and assist with such issues as high fuel costs, short lay-outs between flocks, prolonged reuse of litter, wet litter conditions, persistent disease challenges, severe vaccination reactions, ammonia-related stress and high bird densities.

Today, we find litter amendments being used by broiler growers during all seasons, in most regions of the country and in some cases, are used in entire poultry house. The reasons for this shift in usage are numerous. Yes, we are still challenged with rising fuel costs, shortages and expensive bedding materials in some regions of the country (that continue to force prolonged reuse of litter), and other litter and health related factors. To achieve the genetic potential of today's broilers and maximize performance requires minimizing stressors related to poor litter and air quality. Additionally, the acidifying litter treatments have been shown to be effective in several other bird health related areas. Namely, a potential reduction in the incidence of foot pad burns, carcass degrades and condemnations. Research also suggest that acidification of litter can increase the efficacy of some insecticides for darkling beetle control, and reduce the chick's early exposure to pathogens, including food-borne agents on the surface of the treated litter. There are two additional emerging issues in recent years that further support the use of litter treatments. Poultry welfare standards imposed by major fast-food chains on poultry integrators that recommend birds be raised under minimum ammonia levels, generally less than 25 ppm. Litter treatments have played a vital role in helping to achieve these goals particularly during the brooding period. As growers and those who work in poultry houses, we need to think of our personal health and well-being and minimize our own exposure to levels below

this standard. The second emerging issue that has stimulated the increased use of litter treatments relates to environmental concerns. Treatments that bind elements such as soluble phosphorus which contribute to water quality degradation have gained in popularity in recent years. Litter treatments are also being viewed as an opportunity to aid in the balance of nitrogen to phosphorus in litter to better suit crop requirements when land applied. Of particular interest recently has been the use of these products as a strategy to assist in the reduction of ammonia emissions from broiler houses, a potentially litigious issue facing the poultry industry in the future.

To get the greatest return on your investment when using these products, it is essential to select the treatment option which best matches your management goals and farm situation. Selection of a product that best fits your management's objectives should take into account all factors listed previously: litter and air quality concerns influencing bird performance, health and profitability; food safety and environmental matters. What is the best litter treatment? Again, it depends on your farm situation and objectives. Treatment options include acidifying products, competitive exclusion cultures, enzymes, other inhibitors or agents that bind or alter the release-rate of ammonia. Products are continually under development and may offer new choices in the future. To date, the acidifying agents such as Al+Clear (aluminum sulfate), Poultry Guard (acidified clay) and Poultry Litter Treatment (sodium bisulfate) are the most widely used in the country. However, there are many reasons why even these acidifying products may not meet ammonia control expectations. They include such factors as uneven or timely application, inadequate moisture for activation of some products, improper or inadequate heating and ventilation prior to or following treatment, and insufficient amounts of chemical to meet the ammonia-release potential from the litter. Following the manufacturer's recommendations for proper and safe application can not be overemphasized. Keep in mind, even with proper application and management, these products (acidifiers) only offer temporary control of ammonia and reduction in litter pH.

In summary, the use of litter treatments has expanded over the years to address emerging challenges and needs in the poultry industry. However, they are **only** another management tool and **must be** complimented with proper ventilation and drinker and litter management to be effective.

