Technical Update
from Jones-Hamilton Co.
Poultry Litter Treatment
The Science of Litter Management

Litter Manipulation Through In-House Composting:

Covering All the Angles

Many poultry producing areas of the country are facing a shortage of new bedding and growers are looking for alternative ways to manage their litter other than a complete cleanout. Because of this, many are turning to in-house composting of their litter in order to reduce pathogens and increase litter longevity. This practice of piling the litter into long rows in the house so it will heat up is known by many names: windrowing, in-house litter composting, litter recycling, litter manipulation, etc. While this practice can be very beneficial, there are additional things to consider in order to get the most benefit and to prevent problems from occurring in the subsequent flock.

Pad Acidification During In-House Litter Composting

In today's economic environment, many growers find themselves unable to do a complete cleanout. Instead, they are in-house litter composting in order to manipulate the litter microflora and reduce pathogens after a disease outbreak or to improve performance. Though windrowing can kill the pathogens in the litter, it doesn't address the pathogens that are surviving in the dirt pad. Acidifying the pad with PLT at the same time the litter is composting will help to fully break the cycle of disease in these houses.

Managing Ammonia Challenges After Litter Composting

While in-house composting of litter has many advantages in terms of pathogen control and volume reduction, it can also create extra challenges in providing a proper environment for brooding chicks. The most obvious of these challenges is the increase in ammonia release that occurs once the litter is spread back out and pre-heated for the next flock. Ammonia levels at chick placement on windrowed litter are rarely below the 25 PPM needed for good chick health and performance. Changes need to be made in the use of litter amendments in order to overcome this increased ammonia challenge.

The following steps will help you to properly acidify the dirt pad while windrowing:

1. After the litter has been fully windrowed for the first heat cycle, completely clean and scrape the area of the pad not covered by the pile.
2. Be certain to completely remove the tarry, black layer just above the pad prior to acidification. This layer is high in anaerobic pathogens such as *Clostridium sp*.
3. Put the entire black layer you remove from the pad onto the piles so that it may be composted as well.
4. On the areas of exposed pad, evenly apply PLT at a rate of 100-150-lbs/1000 sqft.
5. Once the first heat is complete, turn the piles onto the treated area of the dirt pad.
6. Repeat steps 1-3 on the newly exposed areas of the dirt pad.
7. Continue to repeat all steps until the entire pad has been treated.

Why Do Ammonia Levels Increase on the Next Flock After Litter Composting?

There are two drivers to the amount and rate of ammonia release from the litter. These are temperature and surface area. In order to have the proper environment for the chicks at placement, the temperature of the litter has to be increased to keep the chicks comfortable. This means that ammonia release from the litter will automatically increase as the litter heats up.

The second driver of ammonia release is surface area. Typical de-caking or crusting procedures in between flocks are meant to remove only the caked litter without disturbing the areas underneath. In windrowing however, the surface area of the litter is intentionally increased in the process of forming litter piles. Increasing the surface area through windrowing dramatically increases the available surface ammonia can be released from (fig. 1). It is not unusual for ammonia concentrations during brooding on recently composted litter to be 200-500 PPM of ammonia or more. This is not an ideal environment for chicks and the performance of the flock can be greatly impacted. In some complexes, birds have been routinely a half-pound lighter due to this high ammonia exposure after windrowing. All litter acidifiers applied to these houses at the standard rate of application will be overcome by the increased ammonia challenge.

Proper PLT® Litter Acidifier Use after In-House Composting

In order to maintain air quality and ammonia levels below 25 PPM during brooding, much higher rates of PLT will be necessary to neutralize the high ammonia challenge. In general, PLT application rates need to be increased by 50-100% over the normal rate for the house type and litter age. Houses that would normally use 75-lbs/1000 sqft PLT should now use 125-lbs. for example. If your normal application rate is 100-lbs/1000 sqft you should increase to 150-200-lbs/1000 sqft in order to be able to counteract the high levels of ammonia being released when litter is leveled and pre-heated after windrowing.

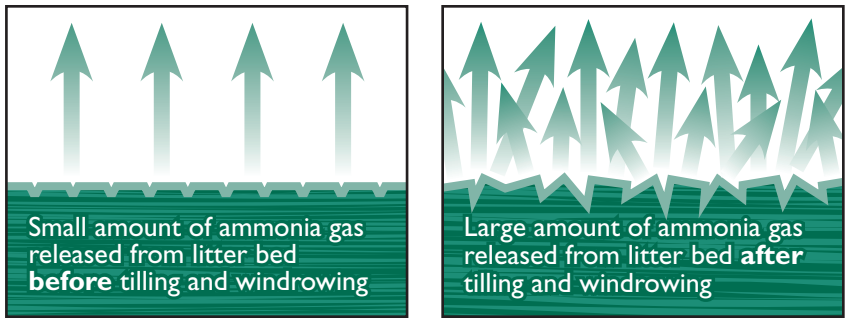

Figure 1. Increased Surface Area = Increased Ammonia Release

Two to three long, triangular windrows of litter *(top)* are formed for in-house litter composting. Once the proper temperature has been achieved, the rows are turned *(bottom)* in order go through a second heat cycle. A large amount of ammonia gas is released during the turning process because of the increased surface area.

Apply PLT® at a rate of 125-200 lbs/1000 sqft prior to brooding on litter that has been windrowed or composted during the down time between flocks.

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