# USDA-CSREES 2006 National Water Quality Conference

## In-House Poultry Litter Pasteurization Pilot Project

This was a pilot study to look at the potential of treating poultry litter in-house between flocks of birds. The pilot windrowed the litter to study: 1) litter pathogen reduction; 2) litter volume reduction; and 3) ammonia. The short time (7-10 days) between flocks is too brief a time period for complete microbial decomposition (composting) to occur. However, initial heat generation in the windrowing process may be sufficient to provide benefits.

The pilot involved windrowing the litter and turning with a tractor driven aerator. Three 100 ft. windrows were built in 2 poultry houses. Two windrows in each house were turned, one was left static. Different turning time regimes were used. Ammonia levels/readings were taken before and after turning of windrows. Microbial samples were taken before the windrows were built, during the trial after turning and at the end of the pilot. Litter was tested for aerobic bacteria, coliforms, E.coli, yeast and mold. Temperature of the windrows were taken after the windrows were built, and periodically throughout the pilot.

Temperatures of the windrows rose steadily. In House 2, the static pile reached 141° F by day 3; the turned rows reached temperatures of 146° F & 138° F by day 4. In House 4, the static pile only reached to 122° F; in the turned windrows temperatures were slower to rise, reaching 136° F and 134° F on day 5. The windrows were slightly smaller in House 4, so this may account for the slower the temperature rise. The turned rows in House 2 stayed above 131° F until they were knocked down on day 8, the static row did not. In House 4, the turned windrows dropped to 136° F and 123° F by day 8, and continued to drop on day 9, the static pile dropped to 80° F. This pilot was only for 8 and 9 days, the EPA rules for biosolids pathogen control were not met.

To determine if pathogen reduction occurred, we measured: Aerobic Plate Count (APC), Yeast, Mold, and Coliforms. Samples were pulled at the start before the windrows were built, mid-trail and at the end. Results based on the limited number of observations showed a 2 log reduction in APC from day 1 to day 4. However, the microbial population was still in the millions, too high to state that the treatment was effective. There was an increase in the average mold populations from day 1 to day 4, however it was not significant. The coliform population was reduced to zero from day 1 to day 4 yeast counts showed reduction through out the trial period but not enough to be considered significant. In the static windrow in House 4 that only reached 122° F, there were more APC than any other windrow.

As the trial progressed ammonia release increased with some piles showing a downward trend around days 6 and 7. After turning, the ammonia levels were so high that the ammonia detection tubes were saturated above the 260 ppm maximum measurement range of the equipment used for testing. After turning, the ammonia smell was very strong. Due to the high ammonia emissions from the piles during turning, air quality and emissions could be an area of concern as it pertains to human health, metal structural damage, and air pollution.

This process may have potential for producers to manage litter to prolong the time between cleanouts and allow a more beneficial cleanout timetable. It may also have potential in certain water watersheds where land application of litter may need to be “pathogen reduced” to protect drinking water supplies. A more thorough study, utilizing the process in the entire house, with more replications is needed to investigate the potential advantages and disadvantages of in-house windrowing and any effects on bird performance.

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