

Management Guidelines for In-Housing Composting of Litter

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Based research and observations during the past year the following are the current (2008) guidelines for in-house composting of litter between flocks on Delmarva. These guidelines are based on the formation of windrows using aeration equipment (i.e. Brown Bear Corp.) and may be modified in the future as we gain more experience with this procedure.

1. The ideal time to start windrowing is first flock following a total cleanout. If starting with built-up litter, best to implement during warm or moderate weather.
2. Windrowing needs to be implemented within 2 days following bird movement.
3. Must manage litter depth in the range of 4 to 6 inches. If depth exceeds 8 inches, should cut centers from the house prior to windrowing. This should be done in spring or fall and when there is suitable storage, land application or other alternative litter uses.
4. If caking exceeds 3 feet wide and/or 3 inches thick under the nipple lines, it may be necessary to re-crust the house after the windrowing process. During cold weather it may be beneficial to remove excessive cake before building the windrows.
5. When starting with built-up litter that has excessive hard pan, windrow the loose litter and remove the hard pan with a skid-steer loader or break it up with a cultivator. In cold weather, it would be best to remove this hard pan from the house. In warmer weather and with dry litter, the hard pan can be incorporated into the windrow. Since it has been suggested that one of the benefits of windrowing is exposing the dirt floor to the atmosphere, as much as practical, removing all litter and hard pan from the floor is recommended.
6. The optimum windrow size is 2-3 feet high and conical shaped. This size windrow heats rapidly, is ease to turn and allows maximum moisture and ammonia release. The number of windrows per house will depend on litter depth and house width. All litter, including that under the windrow base should be turned and go thru the heating process.
7. The goal is reach 130 F and maintain for a minimum of 3 days. Turning the windrows afterwards will expose the cooler portion of the pile to the higher temperatures. Higher temperatures (~150 F) may shorten the time needed between turning. It is important to monitor and record temperatures daily. An inexpensive digital thermometer with a 1 foot long probe can be used.
8. For farms with a significant disease challenge, it would be best to remove all litter from the sidewalls and corners and incorporate into the windrow.

9. Also for farms with a significant disease challenge, it may take 2 consecutive windrowing cycles to break the disease and the disease may re-appear if the litter is not windrowed for 2 consecutive flocks.
10. A **minimum** of 10 day layout is needed to implement the windrowing procedure. Windrowing should be avoided if there is inadequate layout time or in extremely cold weather that does not allow adequate conditions for moisture and ammonia removal.
11. It is best to turn windrows at least once and several times if possible. Turning helps release moisture and ammonia, increase temperatures, reduce cake and increase the percentage of pathogen kill in the litter mass. If time permits, turning windrows on a 2-3 day cycle may be a consideration.
12. If caking or moisture is excessive, re-crusting the house after leveling the litter may be required particularly in cool weather.
13. If piles are formed with a skid-steer, turning may not be an option. These piles tend to be slower to reach desired temperatures in the core of the pile. Although the amount of cake is often reduced by as much as 50%, the house will need to be re-crusting after leveling the litter.
14. The ideal time to get maximum beetle kill is to apply the insecticide to the windrows within 12 hours after pile formation. Also, band application along the sidewalls should be considered if this litter is not incorporated into the windrow.
15. Closing a house following windrowing to retain heat will have little impact on windrow temperatures. More important, in a closed house there will be very high (and dangerous) levels of ammonia and moisture. Depending on ambient weather conditions, the end doors should be open, minimum vent fan set on timer or a tunnel fan set on temperature. Ventilation to **remove ammonia and moisture** should be provided from the day of windrowing until chick placement. When the windrows are being turned, maximum ventilation should be provided to help remove the moisture and ammonia as it being released from the steaming piles.
16. All operators should wear a respirator with ammonia filters when constructing, turning and spreading windrows.
17. The windrows can be spread out and leveled with a skid-steer or blade. A box blade with an adjustable skid to get consistent depth works well. It is critical adequate time be devoted to get the litter level. Leveling the piles at least 4 days prior to chick placement is essential. If time allows and windrow temperatures have been achieved, leveling the windrows even sooner will allow more time for ammonia and moisture removal.
18. To minimize the potential for high ammonia levels in the subsequent flock following windrowing it is **essential** to follow the steps previously mentioned. Higher levels of litter amendment (~25% more) maybe required particularly in cool weather to suppress ammonia. Higher ventilation rates may also be needed during brooding to control ammonia. Failure to control ammonia in brooding can result in poor performance and partially defeat the purpose of the windrowing program!