

## Windrowing 101 - Litter Windrowing as a Tool in the Litter Management Toolbox

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In-house litter windrowing is an option in the toolbox of litter management practices to reduce pathogen challenge and help improve broiler performance. Typically completed during the downtime between broiler flocks, litter windrowing is a practice that has found a place within the industry. While the process can be time consuming and at times needs a touch of finesse, windrowing litter has shown to benefit bird performance and health. Based on empirical evidence from university research and industry field observations, the following points represent current best management recommendations for successful windrowing. Procedural modifications may be needed based on region, climate, or other company-based litter management practices.

### Getting Started

- The ideal time to start a windrowing program is after the first flock following a total cleanout. This allows for first-time windrowers to acclimate to the needs and nuances of the process. If starting with built-up litter, it is best to implement windrowing during warm or moderate weather to allow for increased ventilation strategies to control the flux of ammonia with built-up litter windrowing.
- A time frame of 12-14 days is recommended to implement the windrowing procedure. Windrowing should be avoided if there is inadequate layout time or conditions which do not adequately allow for moisture and ammonia removal.
- Windrowing should be completed soon after bird removal to capitalize on the moisture and heat within the litter. This will enhance the rapid rise in windrow litter temperature. Only with extremely dry litter would additional moisture to the windrow be necessary to achieve desired temperatures.
- The depth of the litter pack is an important point to consider. Ideal litter depth is in the range of 3 to 6 inches. If the litter depth exceeds 6 inches, a portion of the litter should be removed prior to windrowing. Deep litter can be more difficult to manage from a moisture removal and ammonia control standpoint. While increased carbon material enhances temperature development, excessively deep litter can be more difficult to manage.
- The optimal windrow size is 24-36 inches in height and of a conical shape. This litter volume can heat rapidly, is easy to turn, and allows for maximum moisture and ammonia release. Sufficient litter volume helps to initiate microbial activity and

insulates the temperature rise within the windrow. The number of windrows per house will depend on litter depth and house width.

- If litter caking exceeds 3 feet wide and greater than 3 inches thick under the drinker lines, it may be beneficial to de-crust the house after leveling the litter to help control ammonia volatilization prior to and during brooding.
- Since one of the benefits of windrowing is exposing the dirt floor to the drying effects of the atmosphere, turning as much of the litter and hard pan as practical is recommended when forming the windrows.

## Working the Litter

- From a pathogen reduction standpoint, the goal is to reach at least 130 °F and sustain a high temperature for as long as possible. Exposing all the litter to high temperature is needed to reduce or eliminate pathogens. An inexpensive thermometer with a 1 to 3 ft long probe inserted into the top of the pile is one option for monitoring windrow temperatures.
- It is best to turn windrows at least once before leveling and preparing for the next flock. All litter should go through the heating process. Turning helps release moisture and ammonia, increase exposure time to high temperatures, reduce cake, and increase the percentage of pathogen kill in the litter mass.
- Darkling beetles will start migrating to the surface of freshly windrowed litter within a short time period after windrow formation. An ideal time to get maximum beetle kill may be to apply an insecticide to the house and windrows within the first few hours after pile formation. There may be an opportunity to decrease the amount of insecticide application since high windrowing temperatures can also aid in reducing darkling beetle populations.
- For farms with a disease challenge, it is best to remove all litter from the sidewalls and corners and incorporate this litter into the windrow. The entire windrow should be shifted during the turning process to expose the litter mass to high temperatures and the floor to the drying effects of the atmosphere. For farms with chronic disease challenges, it may take 2 or more consecutive windrowing events (flocks) to break some diseases (eg. Dermatitis) and to minimize the re-occurrence.
- Closing up houses following windrowing to retain heat will have little impact on windrow temperatures. More importantly, in a closed house there will be very high (and dangerous) levels of ammonia, carbon dioxide and moisture. Circulation fans should be kept on to help move the air and dry down the litter. Ventilation to remove ammonia and moisture should be provided from the day of windrowing until chick

placement. When the windrows are being turned, for worker safety, maximum ventilation should be provided to help remove moisture and ammonia from the house.

## Completing the Process

- It is critical that adequate time be devoted to leveling and cooling down the litter. Leveling the windrows at least 3-4 days prior to chick placement is recommended to help dry out the litter, reduce the microbial composting activity, and purge ammonia.
- Increased application of a litter amendment (25% +) may be necessary to suppress ammonia, particularly in colder weather. Higher ventilation rates may also be needed during brooding to control ammonia. Failure to control ammonia during brooding can result in poor performance and partially defeat the benefits of the windrowing program. Ammonia control tends to be more manageable after a few flocks once a windrowing program has been initiated.

Windrowing litter between flocks has the potential to improve broiler performance, bird health, and improve the poultry bottom line. Procedures and outcomes for in-house litter windrowing are continually being revised as new information becomes available. Windrowing remains as an effective tool in the litter management toolbox.