

Department of Biosystems Engineering and Soil Science

COMMERCIAL POULTRY PRODUCER'S GUIDE TO DISPOSAL OPTIONS FOR HPAI MORTALITIES IN TENNESSEE

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On Sunday, March 5, 2017, a news release by the Tennessee Department of Agriculture (TDA) documented detection of highly pathogenic avian influenza (HPAI) at a commercial broiler breeder farm in Lincoln County, Tennessee (tn.gov/agriculture/news/48946). Waterfowl are natural reservoirs (carriers) of AI viruses. While the viruses may cause marked illness and fatality in domestic poultry, waterfowl often show little to no signs of infection.

This fact sheet is designed to help commercial poultry producers in Tennessee understand how the response to this event is being coordinated and particularly the options available for disposing of depopulated birds. Another excellent source of information is the USDA website devoted to avian influenza (aphis.usda.gov/aphis/ourfocus/animalhealth/animal-disease-information/avian-influenza-disease).

First things first. It is important to understand certain characteristics of this HPAI outbreak. First, there is very low risk of transmission to humans and poultry products from affected flocks will not enter the food chain. There is no evidence that people can acquire AI by eating poultry products. The HPAI strains that have been found in the United States have not been detected in humans. Second, this disease, to date, has mainly affected older birds, so primary breeder, broiler breeder, and pullet farms may be more susceptible than broiler farms. **However, recent research does suggest that younger (broiler aged) birds are susceptible to HPAI.** Third, to control the spread of HPAI in commercial poultry flocks, the entire farm flock premises must be depopulated as quickly as possible to control the spread of the disease. **It has been well-established that depopulating within 24 hours of detection is paramount to preventing further outbreaks.**

Who has control of depopulation and disposal? The control of what happens to a commercial poultry flock affected by HPAI in Tennessee is the outcome of a coordinated effort among the integrator, the state veterinarian (tn.gov/agriculture/article/ag-businesses-statevet), USDA officials and the grower. **Commercial poultry producers in Tennessee should consult with their live**

production/flock manager for information on the response to HPAI on their farm. However, all commercial poultry producers should have an HPAI response plan already in place and be aware of the clinical signs associated with HPAI. If a flock is suspected to be affected by HPAI or low pathogenic avian influenza (LPAI), samples will likely be collected by the integrator and tested by the Tennessee Department of Agriculture Kord Laboratory (tn.gov/agriculture/article/ag-businesses-diagnostic-lab). If detection is found or suspected, samples will be rushed to the USDA National Veterinary Service Laboratories (aphis.usda.gov/publications/animal_health/2014/fsc_nvsl_rev.pdf) in Ames, Iowa, for verification and sub-typing. The integrator, the state veterinarian, and USDA will be working together during this time to determine if depopulation should begin without delay, or if verification should be obtained first. USDA offers indemnification payment for depopulated birds if the required steps are followed (aphis.usda.gov/publications/animal_health/2016/hpai-indemnity.pdf).

Who maintains the control zone? HPAI is a disease that must be reported to the state veterinarian and USDA so that measures can be put in place to control the spread of the disease because it will impact our ability to export poultry products to other countries. A control area will be established by the TDA and USDA around the affected farm (6.2 mile minimum radius from the index farm). Release of poultry products from this control zone is managed and regulated by USDA and TDA and is contingent on continuous flock monitoring with negative AI results, in addition to product specific biosecurity requirements.

Who determines which disposal options are appropriate? Preparation for the current HPAI outbreak has been ongoing for more than two years by a panel of experts on an Incident Management Team (IMT). This panel was led by the Tennessee Emergency Management Agency (tnema.org) and Dr. Charles Hatcher, state veterinarian, and included representatives from the commercial poultry industry in Tennessee, as well as associate professors Shawn Hawkins and Forbes Walker from UT Extension. This panel carefully considered which disposal options were most appropriate for Tennessee, including burial, composting, incineration, rendering and landfilling. Incineration, rendering and landfilling are low-priority disposal options because they are not timely, may require the birds to be transported from the affected farm, or the equipment required cannot sustain a large-scale HPAI event.

Burial. Burial is a good option for disposal of depopulated birds, particularly when the size and infrastructure of the production houses at the affected farm precludes in-house composting. The standard for selection of burial sites is the Tennessee USDA Natural Resources Conservation Service Guide Sheet 316 (efotg.sc.egov.usda.gov/references/public/TN/Emergency_Disposal_Animal_Mortality_TN316_Guide_Sheet.pdf). This standard normally limits the extent of any single burial site to 1/10th acre. On affected farms, a subject matter expert from USDA NRCS may help select burial sites that meet the guidelines listed below and shown in Figure 1:

- At least 300 feet up-gradient or 150 feet down-gradient of a private well.
- At least 165 feet from a property line or public use area.
- At least 100 feet from a water body, stream or drainage way.
- No closer than 2 feet to bedrock or the seasonal high water table.
- Soil with a permeability of less than 2.0 inch/hour.

Be aware that not all premises will meet these guidelines. Burial sites must be less than 1 acre to avoid permitting and a potential property title disclosure of the disposal activity. **These sites should be pre-selected and be part of your farm AI response plan.** If burial is not an option for your premise, or an option extended by TDA, USDA or the integrator, then in-house composting will likely be used.

Composting. Composting of HPAI mortalities is an excellent disposal method and is advocated by the University of Tennessee and the TDA. UT Extension has performed many on-farm mortality composting experiments with large animals and has previously published instructions (extension.tennessee.edu/publications/Documents/W251.pdf) on the techniques we've seen work best. Unfortunately, in-house composting may not be timely and practical if the infrastructure of the affected production houses is typical of Tennessee breeder houses.

It is possible to compost poultry mortalities outside; however, the site layout must be suitable for constructing the windrows, which can be expected to be 10-15 feet wide at the base, 6-8 feet tall, and the length of the production houses. Additional space is necessary for the equipment (typically an articulated front-end loader) to build and turn the windrows. Lastly, composting outside may not be extended as a disposal technique by TDA, USDA or the integrator at this time because vectors that can spread the disease, and particularly flies, are already active because of our mild winter.

What is composting? It is a simply a planned and managed process to promote the aerobic (with oxygen) degradation of organic matter and has the following primary requirements:

1. Air (oxygen) must be able to permeate to the decomposing carcasses.
2. The carbon-to-nitrogen ratio must about 30:1 (this requires the addition of carbon for mortality composts, ideally wood chips, shavings, or less ideally, sawdust).
3. The overall moisture content must be 40 to 60 percent.

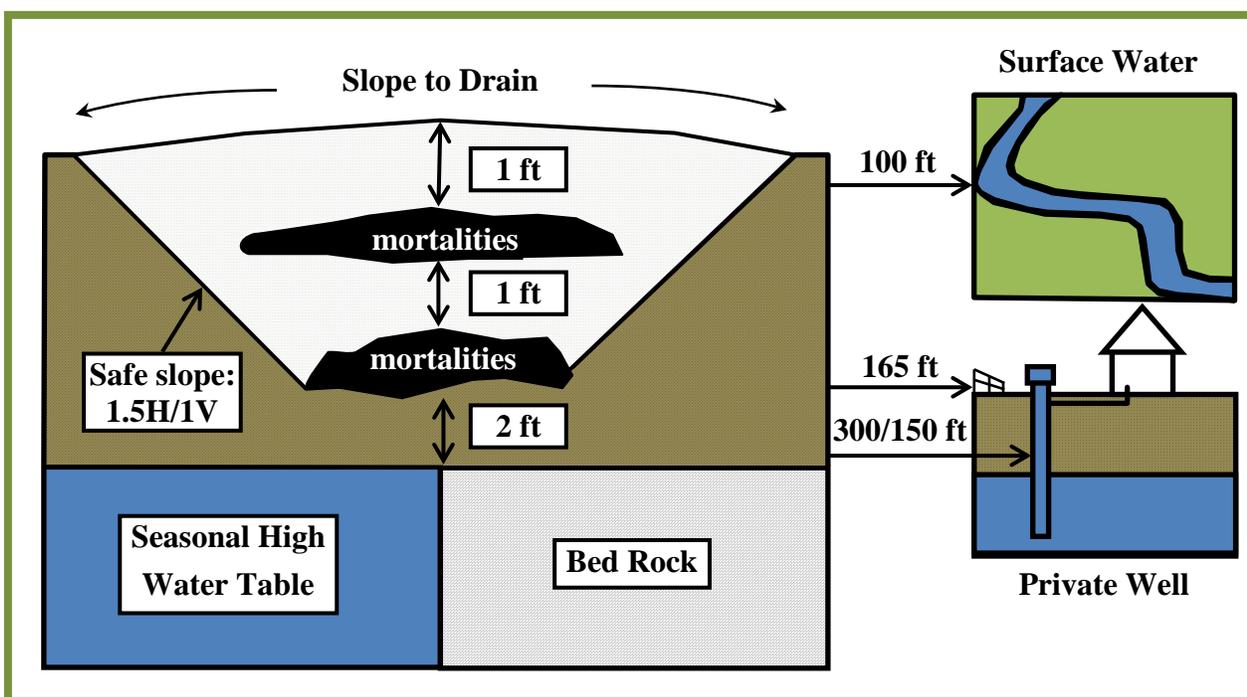


Figure 1. An illustration of the protocols and standard used to bury depopulated poultry due to HPAI in Tennessee.

A recommended protocol (aphis.usda.gov/animal_health/emergency_management/downloads/hpai/mortalitycompostingprotocol.pdf) has been published by USDA APHIS (aphis.usda.gov/aphis/home) for composting depopulated birds. A photograph and cross-sectional image of a compost windrow are provided in **Figure 2**. Commercial producers would be well advised to review this protocol to be familiar with the compost recipe and proper windrow construction methods. The main ingredient needed for mortality compost is carbonaceous material, including wood chips and bedding products such as wood shavings and sawdust. **These materials should be pre-located and secured, along with access to the equipment needed to construct the windrows, as part of your farm AI response plan.**

UT Extension serves as an official subject matter expert for HPAI mortality composting in Tennessee, but you can expect that the integrator will provide their own subject matter expert. A critical factor for windrow performance is to never drive equipment over the base layer of the compost windrow (**Figure 2-B**). Based on our experience, UT Extension would expect that compacting the base layer will restrict airflow (oxygen) and lead to the production of leachate (seeping, noxious liquids) and degrade compost heating performance. When properly managed, mortality composting can be expected to last 3 to 5 weeks, during which time compost temperature data will be collected by the designated subject matter expert. This temperature profile is critical and will be reviewed by the state veterinarian to guarantee HPAI inactivation and the eventual release of the farm from the controlled area restrictions.

Final Comments. Once disposal is complete, the premise must continue to be tested and monitored by TDA. This process is required to assure that re-infection will not occur, which would further delay repopulation. Repopulation can only occur with approval from USDA following proper disposal of the affected flock.

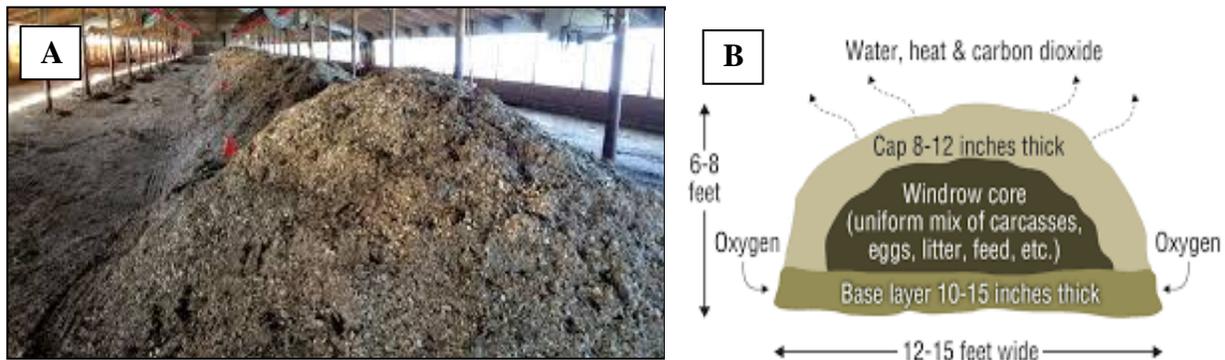


Figure 2. A. Photograph of a HPAI mortality compost windrow (credit Gary Flory). B. Windrow cross-section published by USDA APHIS (aphis.usda.gov/animal_health/emergency_management/downloads/hpai/mortalitycompostingprotocol.pdf).

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