

North Carolina Guidance for Composting of Mass Animal Mortality

N.C. Department of Agriculture and Consumer Services

N.C. Department of Environmental Quality

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Composting of animal mortalities is an environmentally sound emergency disposal solution when the process is managed properly. Composting has been used successfully to manage mortality from hurricane impacts as well as other natural disasters and disease events. The composting process is an active, aerobic biological process which decomposes and stabilizes organic material while reducing pathogens. The end result of the compost process is a recycled, organic material with fertilizer value for land application to crops on agricultural land.

RECOMMENDED SITE ASSESSMENT CRITERIA (OUTDOOR COMPOSTING)

- Perform adequate assessment of outdoor composting areas to prevent contamination of groundwater or surface water by pollutants such as dissolved solids, nitrates or ammonia from decaying organic materials.
- Adequate assessments for outdoor composting should consider the predominant soil type and its textural properties.
- The outdoor compost site should be located so as to minimize the effect of stormwater runoff.
- Composting should not be conducted in the tiled area of an under-drained field.

RECOMMENDED BUFFERS AND SETBACKS (OUTDOOR COMPOSTING)

Compost areas should be:

- At least one foot above the seasonal high water table. Soil textures coarser than loamy sand may require a greater separation distance to the seasonal high water table.
- 100 feet from residences.
- 50 feet from the property boundary unless the owner of the adjacent property is the same person or entity.
- 50 feet from intermittent, perennial streams or public body of water.
- 25 feet from ephemeral streams, waterways or ditches.
- 100 feet from an existing well.
- Alternative setbacks may be determined based on site-specific criteria.

RECOMMENDED PROCESS MANAGEMENT CRITERIA

- Adequate carbon material should be available to ensure a balanced carbon-to-nitrogen ratio. Dry carbon material will need to be added to make wet litter workable and create a windrow with ~60% or lower moisture level. Sources include shavings, sawdust, wood chips, dry litter, mulch, etc. Carbon sources with particle sizes greater than 1-2 inches should not be considered.
- Construct indoor or outdoor windrows with a 12-24 inch base of carbon material 8-12 feet wide (alternative sizes may be considered).
- Use available equipment to combine carcasses and carbon/litter material together prior to placing it on the 12-24 inch base.
- Windrow construction should prevent carcass exposure.
- Construct windrows to a 4-8 foot height and cap with 6 - 12 inches of carbon material with sufficient structure to remain in place during normal weather events.
- Leachate from the base of the windrow is indicative of excessive moisture within the windrow and additional carbonaceous material may need to be added. Leachate should not discharge to any surface water body, waterway or ditch.
- Compost should be managed as instructed by the Compost Subject Matter Expert (SME). Compost can be moved outdoors if indoor composting was utilized initially.

RECOMMENDED MONITORING CRITERIA

- Temperatures at 18 and 36 inch depths should be taken at 5 locations along the windrow to ensure adequate temperatures (110° Fahrenheit or above) are being achieved at both depths. Temperatures should be monitored every 2 or 3 days for approximately two weeks to ensure that thermophilic temperatures are reached.
- If elevated temperatures are not reached, the SME should evaluate the compost windrows and correct the problem.
- If pile temperatures decrease early in the composting process, there may be inadequate oxygen (<5%), requiring the pile to be mixed or aerated.
- Excessive temperatures over 160 degrees Fahrenheit should be closely monitored to prevent spontaneous combustion.
- Calibration of temperature probes should be considered to ensure their accuracy.

RECOMMENDED STORAGE AND LAND APPLICATION OF COMPOST CRITERIA

Composted material that satisfies the above criteria and has been certified by the SME may be transported offsite for storage, disposal (at a permitted facility) or land application. Class B compost distribution requirements should be followed to include restricting distribution to land and mine reclamation, silviculture, and agriculture (on crops not for human consumption).

Other beneficial uses may be approved by NCDEQ to include the use of the material as alternative daily cover at landfills.

The following are recommended setbacks and practices for the storage and land application of compost:

Storage (stockpiles):

- Compost stockpiles should be at least 100 feet from residences.
- 100 feet from any well.
- 50 feet from intermittent, perennial streams or public body of water.
- 25 feet from ephemeral streams, waterways or ditches.
- 50 feet from the property boundary unless the owner of the adjacent property is the same person or entity.
- Locate stockpiles separately from litter stockpiles.
- Cover with additional carbon material if odors, vectors, etc. are a concern.

Land application:

- Land application of compost should be at least 100 feet from residences.
- 100 feet from any well.
- 50 feet from intermittent, perennial streams or public body of water.
- 25 feet from ephemeral streams, waterways or ditches.
- 50 feet from the property boundary unless the owner of the adjacent property is the same person or entity.
- Compost that is not cured for several months may have a negative impact on sensitive crops.
- Compost should be applied at no greater than agronomic rates.
- Records should be maintained of dates the compost was removed from the farm, estimated amount of compost removed, and the location of sites where compost was land-applied.
- Alternative setbacks may be determined based on site-specific criteria.

RECOMMENDED ADDITIONAL COMPOSTING CONSIDERATIONS

- Further composting of the mortality may be conducted in addition to the minimum requirements in order to reach a Federal Class A standard. Class A standards for windrow composting include five turning events over a 15-day period where temperatures are at or above 131 degrees Fahrenheit. Additional sampling of the finished product for heavy metals, pathogens, and inert material is required for Class A material. Class A composted material less restricted for distribution options.

- Compost should not be distributed and marketed to the public unless it meets federal Class A standards and the facility is issued a permit by DEQ Division of Water Resources.
- Siting of compost windrows should be considered to ensure they can be accessed by heavy machinery and firefighting equipment.
- Siting locations for storage of carbon materials that are in close proximity to the barn (indoor composting) or the outdoor windrow area should also be considered.
- Analytical testing of finished compost is recommended to ensure agronomic loading rates are appropriate in land application systems. The NCDA&CS Agronomics Division offers waste analysis testing to determine composted material nutrient content.

ADDITIONAL REQUIREMENTS

- When each project is complete, the compost SME will sign a form to verify that the compost process was initiated, conducted and completed such that the materials used to dispose of the poultry carcasses and/or litter using the composting process did address potential threats to public health or the environment.
- Documentation will be obtained from the farmer to verify that finished compost will be utilized for agricultural purposes and not sold or distributed to the general public.