

Preventing Fires in Manure Storage Structures

Poultry litter is a valuable resource, not just a byproduct of poultry production. A manure storage structure is an important part of managing poultry litter to preserve nutrient content and store litter in an environmentally sound manner.

Storing litter provides flexibility in the timing of application, allowing field applications at the best time for plant nutrient uptake. Storage structures provide protection from weather, preserve nutrients in manure, and prevent nutrient losses to surface water.

It is essential that poultry litter be stored properly to avoid the danger of fire caused by heat generated within the manure pile. As microbial activity occurs within the pile, heat and methane gas are produced. Heat is also produced at the boundary between moist and dry litter. If the pile is insulated or compacted, overheating and resultant spontaneous combustion may occur as temperatures climb above 190° Fahrenheit.

The following conditions can contribute to manure storage structure fires:

- **Moisture:** When dry litter comes into contact with moist litter, the dry litter absorbs moisture and heat is released.

In a large pile, the heat released is significant. If heat cannot escape, overheating may result.

- **Layering:** If new litter is stacked on top of old litter or pushed up against an older pile of litter this will allow moist (new) litter to come in contact with dry (old) litter. As a result, the area between new and old litter becomes a heat producing zone.
- **Compaction:** Litter may be compacted by driving equipment on the manure pile while loading the storage structure. Heat is trapped in a compacted pile. Never drive equipment on a pile when loading manure in a storage structure.
- **Pile Size:** Heat is more easily released from a smaller pile. The larger the pile



size, the greater the chance of excessive heat buildup and fire. Pile height is most critical. When creating a pile in the storage structure, limit the height to 5-7 feet in the middle of the pile, and 4 feet against the walls. Piles that are stacked too high create an insulating compacted layer that traps heat.

Recommendations for Preventing Fires:

- Never mix moist litter or composted dead birds with dry litter.
- Protect litter in shed from wind driven rain.
- Do not wet litter down in hopes of preventing a fire, just the opposite may occur!
- Avoid layering new litter on top of or next to old litter. Do not add composted birds to manure pile.
- Avoid compaction. Never drive equipment on a manure pile.
- Limit pile height to 5-7 feet in the middle of the pile, and 4 feet against walls.
- Because of the danger of fire, do not store expensive equipment in a manure storage structure.
- Monitor the temperature within the manure pile: if the temperature exceeds 190°F or smoldering occurs, manure will need to be removed from the pile. If overheating is expected, the fire department should always be on



hand when manure is removed from the pile as it may burst into flames when exposed to air. A garden hose will be inadequate to extinguish such a fire.

For more information, contact your local University of Maryland Cooperative Extension Office.

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