FACT SHEET

Poultry Manure Fires

United States Department of Agriculture

Natural Resources Conservation Service

Cooperative Extension Service

Avoiding Poultry Manure Fires

Poultry manure has the potential for spontaneous combustion (self ignition). While spontaneous combustion in hay and silage stored in silos has been studied, not much is known about the process in poultry manure. The following recommendations are based on information collected from Natural Resources Conservation Service personnel and Delaware and Maryland Cooperative Extension System personnel. This information will be updated as more is learned about poultry manure fires.

1. Do not place wet poultry manure in contact with dry poultry manure. Wet manure is generally defined as having a moisture content of 30 percent or more (i.e., cleanout). Do not place manure of different ages in contact as the first pile may have dried out and you may be placing wet manure against dry manure.

2. Studies on other materials have shown there is a critical mass which will cause spontaneous combustion. A smaller mass or pile will dissipate the heat generated within. Therefore, it is recommended that poultry manure be placed in windows of a maximum of eight feet in height with the edges not heaped against the side boards or the next window.

3. Do not compact poultry manure by driving equipment on the pile or by packing the manure with equipment.

4. Keep the stored manure dry by protecting it from driving rain. You can do this by closing openings in the structure with louvers or by keeping stored manure away from these openings.

5. Check the temperature of your stored manure daily using probe-type thermometers in several locations. Temperatures of 160°F or less are normal. Temperatures above 160°F are an indication that closer monitoring and caution are needed. At temperatures of 190°F or above, you should make preparations to empty the storage structure. Preparations include notifying the fire department of a potential fire.

6. If you do observe a smoking manure pile, remove the manure from the storage structure, making sure you have fire control equipment present. The manure may burst into flame as you dig into it and expose it to oxygen. The fire control equipment is necessary because a garden hose is not an adequate water supply to control a fire if it develops. Spread the manure in a field using caution to avoid catching combustible materials in the field on fire. Be aware that it is possible to probe and miss a hot spot in the pile.

7. Do not store equipment and manure together in a manure storage structure.

8. Consider purchasing fire insurance for the structure.

For additional information you can call:

New Castle County, Delaware	
NRCS	(302) 832-3100
Cooperative Extension	(302) 831-2506
Kent County, Delaware	
NRCS	(302) 697-2600
Cooperative Extension	(302) 730-4000
Sussex County, Delaware	
NRCS	(302) 856-3990
Cooperative Extension	(302) 856-7303

NOTE: These recommendations are based on research performed on other farm products with similar problems of spontaneous combustion. Recommendations are therefore conservative in nature. Ongoing research will more closely define the problems in poultry manure, and we will be able to give more definitive solutions.

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Poultry Manure Fires (December 1991 Survey Results)

Survey Results

A survey of the operators of 104 poultry waste storage sheds in Delaware was conducted in December 1991 by the USDA, Natural Resources Conservation Service (NRCS), Cooperative Extension System, and Delaware Conservation District personnel. It was found that seven sheds had experienced one or more fires due to spontaneous combustion. An additional 12 manure piles experienced excessive heat during the storage period. A statistical analysis of the survey data was performed at the University of Delaware. The analysis did not find a common cause of all fires, but it did reveal the following management factors and other circumstances which were present in the majority of piles which did burn or char. All manure piles generate heat through the biological activity that occurs in the pile. If this heat is not allowed to dissipate through the pile to the outside, temperatures inside will build up to a critical point.

Factors to Consider

Layering: Piles which experience fires were all layered to some extent either horizontally or at an angle. Layering restricts the movement of heat.

Compaction: The majority of manure piles that experienced fire were compacted. Compaction restricts the movement of heat.

Moisture: Moisture was found to be a critical factor in manure pile fires. All structures having fires had manure from houses with plasson waterers or water troughs in some or all of the houses. Higher moisture levels cause more heat to be generated in the pile.

Pile Size: The height and width of a pile were found to be more critical then the pile length. It was found that the larger the pile size, the greater the chance for excessive heat or fire.

Advice

Pile height should not exceed eight feet. Do not pile manure against the side wall of the structure. Avoid layering or compacting the manure. Do not store wet manure in a storage shed. Manure that gets wet while inside a storage shed should be removed.

Assistance is Available

New Castle County, Delaware
- NRCS/New Castle Conservation District (302) 832-3100
  http://www.newcastleconservationdistrict.org/
- Cooperative Extension (302) 831-2667
  http://extension.udel.edu/ncc/

Kent County, Delaware
- NRCS/Kent Conservation District (302) 741-2600
  http://kentcd.org/index.htm
- Cooperative Extension (302) 730-4000
  http://extension.udel.edu/kentcounty/

Sussex County, Delaware
- NRCS/Sussex Conservation District (302) 856-2105
  http://www.sussexconservation.org/
- Cooperative Extension (302) 856-7303
  http://www.rec.udel.edu/

Prepared by the USDA, Natural Resources Conservation Service and Cooperative Extension System, and the Delaware Association of Conservation Districts.