



# HOT HAY ALERT

## Prevent Hay Fires On Your Farm

August 2006

Brian S. Aldrich, *Agriculture Resource Extension Educator*, **Cornell University Cooperative Extension Cayuga County**  
Eric M. Hallman, *Director*, **Cornell Agricultural Health and Safety Program**

### Risk of Fires Caused by Wet Hay

Farmers who make dry hay face problems in field drying most every season. In some seasons, it is extremely challenging to make dry hay. Frequent showers, constant cloudiness and wet field conditions increase the risk of putting up hay that is not dry enough to cure well in the barn. Spontaneous combustion is a real problem for hay producers and buyers. **To prevent fires in the haymow, it is extremely important to know the weather conditions under which the hay was made, especially if it is hay you are purchasing and did not make yourself!** Stacking small, rectangular bales at 20% moisture or higher, and large or round bales at 16% moisture or more, potentially creates the conditions for a fire. Fires in freshly cut hay usually occur within the first two to six weeks after baling.

### How to Tell if You Have a Problem

Some heating in new hay is normal. The quickest way to tell if you have a problem is to drive a long pipe (8-10 ft., 3/8-inch diameter) or an iron or copper rod into the center of the stack. Leave it in for 20 minutes and then pull it out. If it's too hot to hold in your hand, the hot hay should be removed immediately. Another warning sign is that smoldering hay gives off a strong, pungent odor.

If you suspect you have a problem for any reason, monitor the temperature of the haystack. A temperature of **150°F** or higher means that hay is entering the danger zone. The following table provides guidance for actions to take depending on the temperature of the hay. We have put this table together using several published references, and have chosen the most conservative values where there were differences.

Temperature	Action Steps
120°F or below	No concern, no action needed.
120 to 140°F	Check temperature daily.
140 to 150°F	Check temperature twice a day.
150°F	Entering the danger zone! Check temperature every two hours.
150 to 160°F	Begin moving hay out of the structure. At a minimum, stacked hay should be disassembled to allow more air to move around heated bales to cool them.
160 to 175°F	Call fire department; have them on-site before moving hay.
175°F	The danger of spontaneous combustion is rapidly increasing. Hot spots or fire pockets are likely. If possible, stop all air movement around hay. Call 911 to alert of a possible hay fire.
185°F	Remove hot hay. This should be done with the assistance of the fire service. Fire service should be prepared for hay to burst into flame when it contacts fresh air. Move hay away from buildings with bucket-loader or bulldozer.
200°F or higher	Hay is almost sure to ignite. Remove hot hay. This should be done with the assistance of the fire service. Fire service should be prepared for hay to burst into flame when it contacts fresh air. Move hay away from buildings with bucket-loader or bulldozer.

Sources: 1. Hall, Marvin. 2006. Penn State Field Crop News Vol.06:04. <http://fcn.agronomy.psu.edu/2006/fcn0604.cfm>  
2. Murphy, Dennis J., and William C. Arble. 2000 (revised). Extinguishing Fires in Silos and Hay Mows. NRAES-18. Natural Resource, Agriculture, and Engineering Service, Ithaca, NY. Table 6-1, p.27. [www.nraes.org](http://www.nraes.org) . 607-255-7654. [nraes@cornell.edu](mailto:nraes@cornell.edu)

### How to Check the Temperature of a Haymow

Commercial hay thermometers are too short to monitor the interior temperature of a haymow. The National Ag Safety Database ([www.cdc.gov/nasd](http://www.cdc.gov/nasd)), "**Hay Fire Prevention and Control**", offers the following instructions on how to fabricate and use a longer probe to measure temperatures deeper inside the haystack:

...A simple temperature probe can be made in the farm shop from a 10-foot piece of 3/4-inch diameter iron pipe. Drill eight 3/16-inch diameter holes about three inches from one end then hammer that end of the pipe together to form a sharp edge (Figure 1). Check hay temperature in the center of the stacked hay. The easiest way to do this is from the top of the stack. Do not walk directly on the stacked hay; pockets may have already burned out under the hay surface. Place boards, plywood, or a ladder on the hay and walk on those instead (Figure 2). This will spread the weight of the person monitoring the temperature over a larger area and help keep him from falling into burned out cavities. Be sure to use a lifeline in case the hay surface collapses into a fire pocket. A second person, standing safely away from the hay, should hold the other end of the rope to pull the person monitoring the temperature out in case the hay surface collapses into a fire pocket. Drive the probe from the top of the haystack into the inner most bales (Figure 3). Lower a thermometer to the end of the probe with a piece of light wire. After 10 to 15 minutes, retrieve the thermometer and read the temperature.

Figure 1. Homemade hay temperature probe with thermometer.

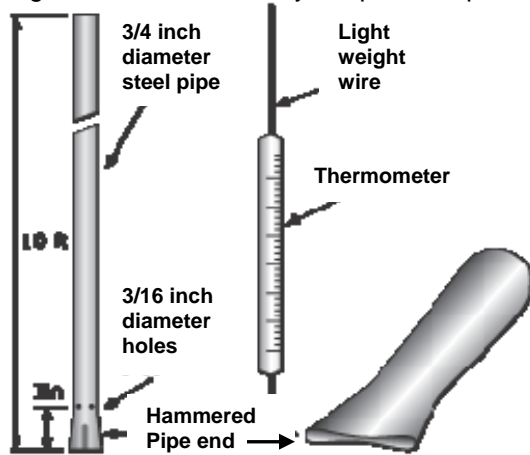
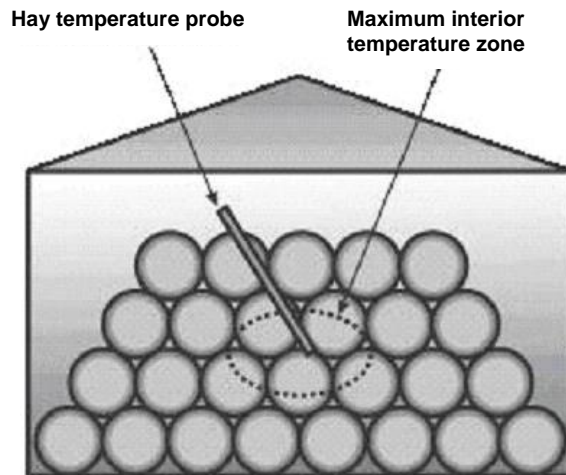


Figure 2. Proper procedure for monitoring hay temperatures.



Figure 3. Proper location for inserting temperature probe.



Source: National Ag Safety Database [http://www.cdc.gov/nasd/menu/topic/fire\\_safety.html](http://www.cdc.gov/nasd/menu/topic/fire_safety.html) .

### Role of Ventilation Depends on Hay Temperature

At lower temperatures, ventilation helps to disperse the heating that normally occurs in stored hay. But at temperatures of 175°F or greater, ventilation will fuel a fire and should be avoided.

### If Hay Starts On Fire

Call 911 immediately if a fire starts in your haymow. Do not wait to see if you can put the fire out yourself. Hay fires can spread very rapidly and soon become uncontrollable. The National Ag Safety Database advises, *“Let firefighters take control of the situation once they arrive. Do not move hay if signs of fire are present. Moving hay exposes the overheated or smoldering hay to oxygen and may cause the fire to burn uncontrollably.”*

### Further Information

The National FARMEDIC Training Program has instructors who can train and assist rural firefighters with the best methods for extinguishing fires on the farm. Contact them at 1-800-437-6010, e-mail [farmedic@mcneilandcompany.com](mailto:farmedic@mcneilandcompany.com), website [www.farmedic.com](http://www.farmedic.com).