

When Hay Gets Hot

Reduce the risk of barn fires

The hay bales you stacked in the barn this summer probably looks safe and secure on the outside. But a danger may lurk inside the stack.

Barn fires destroy property, stored crops, livestock as well as causing a loss of revenue. Each year farmers lose thousands of pounds due to barn fires and whilst investigations show there are many causes of barn fires, one of the most common causes is spontaneous combustion in hay.

Hay is at risk of spontaneous combustion when baled at 18% or more moisture content and immediately stacked inside a building, spontaneous combustion may also occur if the hay is allowed to get wet after baling, so ensure the barn roof and any plumbing is water tight.

Ideally, growers should leave hay unstacked for the first three weeks after baling. During that period, hay temperatures typically rise due to microbial activity and plant respiration — but usually no higher than 130°F. With stacked bales, if the heat cannot escape to the outside edges, the temperature may escalate and fire can result.

The good news: By checking hay temperatures daily those first few weeks after harvest, you can minimize the risk of fire. To monitor hay, buy a sturdy thermometer capable of reading temperatures up to 200°F. Accuracy within 5° is sufficient. Thermometers are available at most farm supply and hardware stores, or from heating and air-conditioning suppliers.

Warning

It is recommended that you do not climb onto the stack, but if you need to, always use a crawl board or a ladder to spread your weight across the stack, as there may be cavities created by the unseen smoldering fire.



For accurate readings, probe the hay in several locations. If temperatures are on the increase, check the hay frequently during the day.

In round bales, check the most tightly packed hay — where heat tends to build — typically 150 to 300mm from the center. For this purpose, a 1 metre thermometer is adequate. To evaluate stacks, you must reach 2 to 3 metres down from the top or in from the side. You can accomplish this by inserting a hollow probe into the hay, then placing the thermometer inside it.

You can make an effective hay-temperature probe from 15 or 22mm steel pipe or electrical conduit. Close one end of the tube, either by squeezing the tube together or by welding a small bolt into its end. If the tube end is squeezed together, a rivet will keep it from separating. Then grind the end to a moderately sharp point.

Lastly, drill three or four small holes (6mm) through the pipe near the pointed end. These holes will allow the thermometer to take a fairly accurate reading when inserted into the probe. If you like, attach handles to the other end of the probe with pipe and/or conduit fittings.

A long-stem dial thermometer (compost thermometer) works well in a probe. A simple glass thermometer, which can be lowered into the probe by a string or wire, also is effective.

One caution: Avoid using a mercury-filled thermometer, as the mercury will contaminate hay if the thermometer breaks.

Table 1. Temperature Interpretations	
Below 130°F	No problem
130 to 140°F	No problem yet, temperature may go up or down. Recheck in a few hours.
150°F	Temperature will most likely continue to climb. Move the hay to provide air circulation and cooling. Monitor temperature often.
175-190°F	Fire is imminent or may be present a short distance from the probe. Call the fire service. Continue probing and monitoring the temperature.
200°F or above	Fire is present at or near the probe. Call the fire service. Inject water to cool hotspots before moving hay. Have a charged hose ready to control blazing when moving hay.

REMEMBER

If you detect temperatures above 175°F, a fire is imminent or nearby. The sight or smell of smoke means the smouldering process has already begun; in any of these cases call the Fire Service immediately.

Do not move any of the hay, as this would expose overheated or smouldering hay to the oxygen and may result in the fire raging out of control.

Once the fire service is present and they have their hoses charged, the hay can be moved under the guidance of the Fire service personnel.

IF IN DOUBT CALL US OUT