

Extension Notes

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AGRICULTURE & NATURAL RESOURCES

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Preventing Spontaneous Hay Fires

Spontaneous combustion hay fires have caused loss of life and valuable nutrition for livestock, but you can prevent them if you keep a watchful eye and know the signs of a problem.

Baling hay at appropriate moistures and monitoring the temperature of recently baled hay are your best tools. Generally, hay will go through a heating phase within one to two weeks after baling. During this time, monitor the hay to make sure it doesn't reach temperatures that can damage the hay or lead to spontaneous combustion.

It is not unusual for the temperature within a bale of hay to reach 100 degrees Fahrenheit, and it may go as high as 130 degrees before beginning to decline. If the temperature peaks below 130 degrees, you may lose some quality but you won't have a danger of fire. With free air circulation around a bale, both heat and moisture can dissipate. A single bale rarely heats enough to catch on fire, but when you place bales close together or stack with other bales that are also heating, it is much more difficult for the heat to escape. A good practice is to leave bales scattered in the barn for three to four weeks before placing them in a stack.

If the bales are wetter than they should be, the temperatures can easily rise above 130 degrees. At 140 to 150 degrees, more microbial growth and chemical reactions within the hay cause it to generate heat at an increasingly rapid rate.

If hay temperatures reach 150 degrees, you need to move bales to allow for better air circulation and frequently check the temperature. At 180 degrees, fire is imminent, and at 200 degrees, it is likely present. In either case, you need to notify the fire department. It is best to wait for them to arrive before removing the hay from the stack in case of a flare up.

Smoke from hay treated with an acid preservative may contain toxic fumes, so keep people away from the smoke and inform the firefighters of any treatments you applied.

To check hay temperature, you may use several types of thermometers. Find one that is durable, easy to use and will measure up to 200 degrees.

Attaching a string or a thin wire and lowering or pushing it into a probe that has been inserted into the hay is one way to use a simple glass thermometer. Do not insert them directly into the hay because they easily break. It is best to use only spirit-filled glass thermometers to prevent accidentally contaminating hay with mercury from a broken thermometer.

You can use electronic thermometers with remote sensors and a digital readout. Avoid LED displays as they are often hard to read in bright light. An LCD is a better choice. Some electronic moisture meters also measure temperature.

Long-stem thermometers, commonly called compost thermometers, are probably the most rugged and reliable. With these types, the price increases with the dial size and length of the stem. It may be tempting to stick these directly into a hay bale, but the stem can be easily bent and the accuracy or operation of the thermometer could be destroyed.

It is best and necessary in most cases to use some kind of hay probe. You can make one for yourself using steel pipe or electrical conduit or you can purchase commercial probes. A video on how to make your own temperature probe is available on the @CarterCoKYAg YouTube channel at <https://youtu.be/VhNslq6pxgk>. The Extension Office also has a hay moisture and temperature probe available for checkout.

Measure the wettest hay first. Probe square bales from the side, round bales from the end. Insert the probe near the center of the bale. In round bales, if the core is loosely formed, probe 6 to 12 inches away from the center where the hay will be more tightly packed.

In large stacks, it may be difficult to reach the center, but it is important to get at least 5 to 10 feet down from the top or in from the side. The most critical factor is to reach where the wettest hay is stored. It is best to probe at several locations and at different depths within a stack to locate the warmest spot.

For more information on hay production contact the Carter County Extension office. The Martin-Gatton College of Agriculture, Food and Environment is an Equal Opportunity Organization with respect to education and employment and authorization to provide research, education information and other services only to individuals and institutions that function without regard to economic or social status and will not discriminate on the basis of race, color, ethnic origin, national origin, creed, religion, political belief, sex, sexual orientation, gender identity, gender expression, pregnancy, marital status, genetic information, age, veteran status, physical or mental disability or reprisal or retaliation for prior civil rights activity.

Upcoming Events:

- The **Grayson Farmer's Market** is open on Saturdays from 9:00 AM until sell out. The market is located in the shed behind the Extension Office. The **Olive Hill Farmer's Market** is located in the Save-a-Lot parking lot and is open on Saturdays and Wednesdays at 8:00 AM and Mondays at 3:00 PM until sell out each day.
- **Hike & Learn** – August 3rd @ 9:00 AM – Meet at the Grayson Lake Dam for a dam tour and then hike the Fishing & Nature Trails with us.
- **Carter County Fair Exhibit Hall** Entries Accepted August 7th from 11:00-1:00. Category descriptions are available at <http://www.cartercountyfair.org/page18/index.html>