

Preventing Hay Fires

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Excessive moisture is the most common cause of hay fires. A chemical reaction in high-moisture haystacks or bales produces flammable gas that can ignite if the temperature is high enough (about 130 F).

Fire is possible in loose, baled or stacked hay stored inside or outside. Hay becomes a fire hazard when the moisture content is 20 percent or higher in small stacked bales and more than 18 percent in stacked large square or round bales. Hay fires usually occur within six weeks of baling.

Reducing the Risk

The best way to prevent fires is curing hay to the proper moisture level before storing it because storing hay with higher moisture results in more heating. Weather conditions during curing have the greatest influence on achieving the proper moisture concentration. Ideal hay-curing weather is slightly windy with a relative humidity of 50 percent or less.

- Do not bale marginally wet hay in the early morning if the moisture concentration increased overnight because of humidity.
- Use specialized hay equipment that increases crop-drying rates, especially during good hay-curing weather, to help reduce the hay's moisture concentration.
 - Conditioning equipment crimps crop stems to allow plant moisture to evaporate and speed the rate of drying.
 - Tedders fluff, spread or move windrows to improve air movement through the crop.
 - Windrow-turning equipment lifts, inverts and fluffs windrows, exposing more of the swath to the sun, speeding hay curing.

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- Use hay preservatives to inhibit or reduce bacterial growth in moist hay.
- Do not pile all of your hay in one spot if possible. That will keep you from losing the entire harvest, as well as barns and equipment, if some does create a fire
- Check your hay moisture levels regularly. If you detect a slight caramel color or distinct musty smell, your hay likely is heating. At this point, checking the moisture is too late; you'll need to monitor the hay's temperature.
- Insert a probe into the haystack to monitor the temperature if you suspect your hay is heating.

You can make a probe from a 10-foot piece of pipe or electrical tubing. Sharpen one end of the pipe or screw a pointed dowel to one end, then drill several ¼-inch-diameter holes in the tube just above the dowel. Drive the probe into the hay stack and lower a thermometer on a string into the probe. Insert the probe in several parts of the stack and leave the thermometer in place for 10 minutes at each site. A long-stemmed compost thermometer also will work.

- Place long planks on top of the hay before surveying the tops of stacks. Do not walk on the hay mass. Attach a safety line to yourself and have another person ready to pull you out in case the hay surface collapses into what likely is a fire pocket.
- Consider creating a firebreak about 15 feet wide around hay stacked stored outside.
- Spread bales in an area away from other feeds and buildings if you suspect a fire could develop.

If Fire is Likely

- Call the fire department immediately if hay temperatures are above 175 F (that means a fire is imminent), or you

smell or see smoke. Do not move any of the hay to avoid exposing overheated or smoldering hay to oxygen, which could result in a fire raging out of control.

- If hay is stored in a building with livestock, evacuate the livestock.

Fighting a Hay Fire

- If the fire is in a building, turn off the electricity if possible.
- Knock down visible flames. A straight-tip nozzle will penetrate deeper into the hay.
- Probe for hot spots and inject water through the probe to cool the hay and raise it to a moisture content that will prevent burning.
- Monitor the wind direction and water the roof of adjacent structures downwind of the fire if possible.
- Begin removing the hay from the barn or stack when the hot spots appear to have cooled sufficiently. Keep a hose handy in case of missed or insufficiently cooled hot spots.
- Use extreme caution when fighting a fire in hay treated with preservatives containing ethoxyquin and butylated hydroxytoluene because they can produce a deadly gas.

After a Fire

- You can use hay that isn't too badly damaged as mulch for erosion control on slopes and in gullies.
- Before using it as feed, have a sample tested for bound protein to see if the hay had too much heat damage.

For more information
on forages, visit
www.ag.ndsu.edu/pubs/forages.html.

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