What's the Risk?

Spontaneous Combustion

THE ISSUE

Hay and straw have the potential to spontaneously combust if the moisture content of the forage is above 20% when it is baled. This risk exists for six weeks from baling. While hay fires are more common than straw fires, the risk still exists. Measuring the moisture content of hay or straw when it is stored in a barn can reduce the potential for a fire.

WHAT'S THE RISK?

The chemical process of spontaneous combustion is complex, as it starts with wet forage and does not involve an external heat source. Wet hay or straw will stimulate microbial growth of the forage, and as these organisms grow, they produce heat, while at the same time drying out the surrounding surface of the hayor straw. The larger the drying surface, the greater the amount of microbial growth. As the bale temperature increases due to the drying, heat resistant bacteria called exothermic bacteria start a process of chemical change that rapidly increases the internal temperature of the bales to the point of spontaneous combustion.

WHAT CAN BE DONE?

To reduce the risk of fire, bale and store hay and straw at moisture levels less than 20%. Monitor the moisture content and the internal bale temperature at least twice daily for the first six weeks after baling. Bales with temperatures over 40° C (104° F) need to be monitored more often. If a bale temperature reaches 75° C (167° F) it should be removed from the barn to cool. Remember, moving hay or straw bales at a high temperature can introduce oxygen and cause them to ignite.

A commercially available bale thermometer that measures both temperature and moisture content is the preferred method for testing bales. The length of the probe should be at least 50 centimeters (20 inches) to properly monitor the interior of the hay bale (either round or rectangular). Commercially available units are strong, durable, accurate, and the cost of the device is not significant when compared to the cost of losing a barn or storage facility to a fire.

We care about you and your farm and want you to get the best information for the types of forage you store. We recommended you ask provincial farm resource groups in your area to identify any specific regional issues relating to storing forage.

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