

SPRING GRAIN DRYING

& storage critical

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As outdoor temperatures increase, stored grain requires attention to prevent losses, says Ken Hellevang, North Dakota State University Extension Service agricultural engineer and grain drying expert.

The stored grain temperature increases in the spring due to an increase in outdoor temperatures and solar heat gain on the bin. Solar energy produces more than twice as much heat gain on the south wall of a bin in early spring as it does during the summer.

Periodically run aeration fans to keep the grain temperature below 30 degrees until the grain is dried if it exceeds recommended storage moisture contents and below 40 degrees during the spring if it is dry.

Stored grain should be monitored closely to detect any storage problems early, Hellevang advises. Grain temperature and moisture content should be checked every two weeks during the spring and summer. Grain also should be examined for insect infestations.

Check the moisture content of stored grain to determine if it needs to be dried. Remember to verify that the

moisture content measured by the meter has been adjusted for grain temperature. In addition, remember that moisture measurements of grain at temperatures below about 40 degrees may not be accurate. Verify the accuracy of the measurement by warming the grain sample to room temperature in a sealed plastic bag before measuring the moisture content.

Corn needs to be dried to 13 to 14 percent moisture for summer storage to prevent spoilage. Soybeans should be dried to 11 percent, wheat to 13 percent, barley to 12 percent and oil sunflowers to 8 percent.

Corn at moisture contents exceeding 21 percent should be dried in a high-temperature dryer because deterioration is rapid at warmer temperatures. For example, the allowable storage time of 22 percent moisture corn is about 190 days at 30 degrees and 60 days at 40 degrees but only 30 days at 50 degrees.

Propane prices are still high but have moderated somewhat. The cost of high-temperature drying

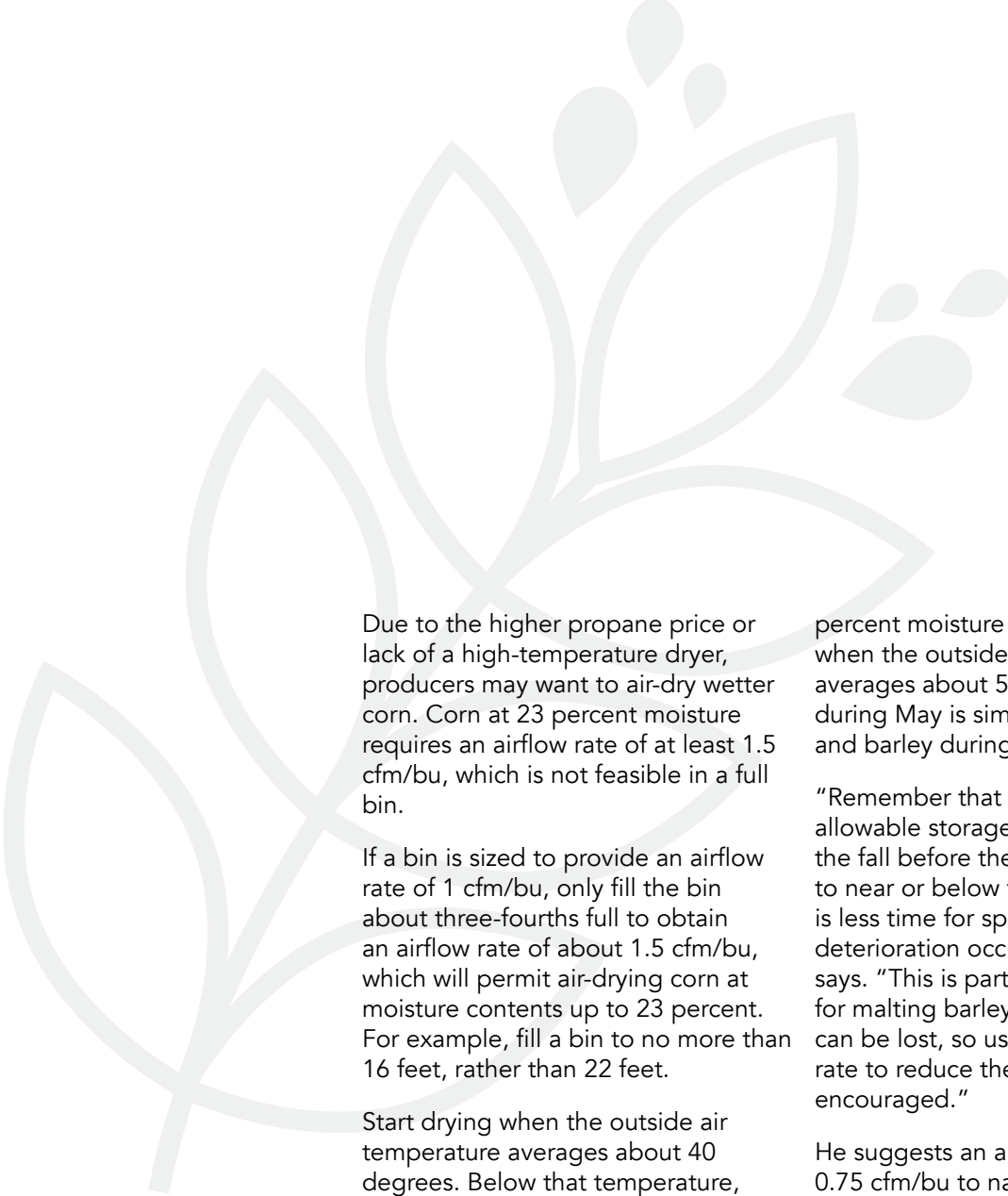
per point of moisture removed using a moderately efficient dryer can be estimated by multiplying the propane price per gallon by 0.02.

For example, the estimated cost per percentage point per bushel of drying with propane at \$2.60 per gallon is 5 cents. To remove 8 points of moisture would cost about 40 cents per bushel for propane.

Obtain the most energy-efficient drying by operating the dryer at the highest temperature that will not damage the corn.

For natural air-drying, assure that the airflow rate the fan supplies is at least 1 cubic foot per minute per bushel (cfm/bu) and the initial corn moisture does not exceed 21 percent.

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Due to the higher propane price or lack of a high-temperature dryer, producers may want to air-dry wetter corn. Corn at 23 percent moisture requires an airflow rate of at least 1.5 cfm/bu, which is not feasible in a full bin.

If a bin is sized to provide an airflow rate of 1 cfm/bu, only fill the bin about three-fourths full to obtain an airflow rate of about 1.5 cfm/bu, which will permit air-drying corn at moisture contents up to 23 percent. For example, fill a bin to no more than 16 feet, rather than 22 feet.

Start drying when the outside air temperature averages about 40 degrees. Below that temperature, the moisture-holding capacity of the air is so small that very little drying occurs. The expected drying time with this airflow rate will be about 50 days. Drying corn during April and early May in North Dakota is similar to natural air-drying during October.

Hellevang recommends an airflow rate of at least 1 cfm/bu to natural air-dry up to 16 percent moisture soybeans. Natural air-drying for oil sunflowers requires an airflow rate of 0.75 cfm/bu for up to 15 percent moisture. The drying should start in early to mid-April, when outdoor temperatures average about 40 degrees.

Use an airflow rate of at least 0.75 cfm/bu to natural air-dry up to 17

percent moisture wheat. Start drying when the outside air temperature averages about 50 degrees. Drying during May is similar to drying wheat and barley during September.

“Remember that some of the allowable storage life was used during the fall before the grain was cooled to near or below freezing, so there is less time for spring drying before deterioration occurs,” Hellevang says. “This is particularly important for malting barley, where germination can be lost, so using a higher airflow rate to reduce the drying time is encouraged.”

He suggests an airflow rate of at least 0.75 cfm/bu to natural air-dry up to 16 percent moisture barley.

Grain storage molds will grow and grain spoilage will occur in grain bags unless the grain is dry. Grain in the bags will be at average outdoor temperatures, so grain will deteriorate rapidly as outdoor temperatures increase unless it is at recommended summer storage moisture contents.

“Also, everyone needs to become aware of safety hazards associated with handling grain and to apply recommended safety practices,” Hellevang stresses.