

PAMI advises managing grain in the bin carefully even in warm harvest weather

HUMBOLDT—This fall’s warm, dry weather forecast is a boon for producers but a researcher at Prairie Agricultural Machinery Institute (PAMI) cautions that grain has to be managed as intensively when it is stored in the bin as when it is being seeded and harvested.

Dr. Joy Agnew, project manager with PAMI Agricultural Research Services, said to minimize the risk of spoilage, both grain temperature and grain moisture content need to be controlled in the bin. “Even if the moisture content is considered dry, all grain must be cooled to 15°C or lower to maintain good storage conditions.”

Cooling grain is as simple as blowing air through it, said Agnew. Low airflow rates, around 0.1 to 0.2 cubic feet per minute (CFM) per bushel, are sufficient for cooling, provided the ambient air is cooler than the grain. “There may be some benefit to turning off the fan during the heat of the day, but as long as the ambient air temperature is even a few degrees lower than the grain, the fan should be running,” she advised.

It could take weeks before spoilage in hot, dry grain is noticed so Agnew suggests cooling the grain as soon as possible after binning. Although the target temperature is 15°C, Agnew encouraged producers to take advantage of any cool autumn air to reduce the average grain temperature to 5°C or lower.

“Fortunately, most bins are equipped with a fan and ducting systems that are well suited for aeration and temperature control,” she said. “The challenge comes when grain needs to be dried because natural air drying (NAD) requires a higher airflow rate—0.5-1 cfm/bu—and it is difficult to achieve these airflow rates with large grain depths.”

Selecting the right sized fan can be difficult and complicated, she admitted, “but an improperly sized fan could put the entire bin at risk of spoiling.” To help with the process, Agnew has produced a video entitled *Selecting Fans for Grain Conditioning and Natural Air Drying* that can be found on the Crop Storage page of the PAMI website (pami.ca/crops/storage/).

Agnew said it is important to remember airflow can be impeded when layers of grain in the bin are not uniform. With big bins, there is a higher chance it will contain grain from different fields harvested on different days with varying moisture content, different levels of maturity or different amounts of foreign material.

How the bin is filled is also important. “Central versus eccentric filling, loading from multiple ports and using grain spreaders and other devices will affect the uniformity of the grain properties and, just like variations in grain layers, can adversely affect the uniformity of airflow,” she said. “In real life, the grain mass is almost certainly not uniform, so airflow rates and uniformity are not well predicted or understood.”

Agnew said more research is needed into the effectiveness and economics of large bin grain storage to ensure producers are able to manage their crops after harvest with much less risk of loss.

PAMI is a full-service applied research and engineering agency specializing in all aspects of machinery. They are owned by the provinces of Saskatchewan and Manitoba and serve agricultural, industrial, and defense and security sectors.

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NOTE: Supporting photography and/or a prepared 250 word story available upon request

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