

Iowa Farmer Today

Consider safety in grain bins of all ages and sizes

By Brandi Janssen

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Take care when handling grain this spring, especially when working in older bins that may lack important safety features.

Photo courtesy Brandi Janssen

Already this spring we've had two grain entrapment incidents in eastern Iowa. Four people were buried while unloading a bin when an outer door opened and flooded the area with grain near Mt. Vernon in February. Then, late in March, one man died after being buried under corn in a 20,000 bushel bin near Williamsburg.

Fatalities and injuries from grain engulfments, along with falls from bins, have been a consistent concern in agriculture over the past years. Higher yields, larger storage facilities, and equipment that can move grain more quickly create very hazardous environments.

But even smaller bins can pose a serious risk, and older bins may not have adequate tie-off anchors or ladder cages that can prevent a fall.

A 2021 surveillance report from Purdue University identified 35 fatal and non-fatal grain entrapment incidences in 2020. That number is a decrease from the 39 cases in 2019, but still higher than the five-year average of 31. The researchers note that because there is no mandatory incident or injury reporting system for much of agriculture, these rates are likely under-reported. They estimate that about 30% of non-fatal cases go unrecorded.

According to the Grain Handling Safety Coalition, based in Springfield, Illinois, no one should enter a grain bin without careful consideration of the hazards, training on proper procedure, and access to both safety equipment and other employees who can be observers.

Entering a bin where grain is flowing is especially hazardous — about 80% of grain engulfments are a result of someone being inside a bin when grain is being unloaded. A person can be fully submerged in flowing grain in less than 60 seconds.

Once a person is buried to their knees, which can take less than 5 seconds, the weight and friction of the surrounding grain makes it impossible to step up or out of it.

A critical component of safe grain entry procedures is “Lock-Out-Tag-Out” (LOTO). Standard in most industries, and required by OSHA in many worksites,

LOTO procedures prevent workers from being injured by unexpected energy release or equipment start-up during maintenance or repair procedures.

In a grain bin scenario, this refers to de-energizing all unloading and conveying equipment. Prior to entering a bin, all grain moving equipment should be shut down and locked with a padlock or restraint that holds the equipment in a safe or “off” position — that’s the lock-out part.

Second, a bright and visible tag should be attached indicating that the equipment should not be energized, unless by an authorized person — the tag-out part.

The Grain Handling Safety Coalition recommends using LOTO before any equipment maintenance or service and before any grain bin entry. They note that failure to lock-out-tag-out is a leading cause of grain bin fatalities.

Equally important to LOTO procedures is having at least one observer stationed outside the bin during entry. The observer should never enter the bin to attempt a rescue.

Instead, their role is to call first responders in the event of an emergency. The observer should maintain constant communication with the worker in the bin, ideally by keeping the entrant in their sight at all times. If a harness and lifeline is in use — a recommended practice when working in a bin that has anchor points — an observer should operate the lifeline.

The air quality within the bin should also be assessed prior to entry. Use a gas monitor to ensure that there is adequate oxygen and no toxic gases, such as fumigants, excessive carbon dioxide, or carbon monoxide generated from combustion or smoldering grain.

Other preventative measures are consistent with best production practices. Keeping grain in good condition reduces clumping and bridging, which makes it less likely that someone will need to go into the bin to knock down grain stuck to the side of the bin or break up clumps that are clogging equipment. Grain in good condition also contributes to better air quality in the bin.

Finally, be attentive to fall risks. Older bins may not have roof ladders, or the ladder rungs may be too close to the side of the bin. Maximum loads on older bins may be lower than modern ones.

Consider installing stairs with handrails or ladder cages to improve safety and inspect ladders regularly for corrosion, bent rungs or other deficiencies that could contribute to a fall. Remember three points of contact when climbing and wear work shoes with cleated, slip-resistant treads.

April 4-8 is Stand Up for Grain Safety Week. Events include a number of webinars covering electrical safety, working in extreme weather, Personal Protective Equipment and workplace wellness. These, along with a number of other resources are available at standup4grainsafety.org.

In addition, the Great Plains Center for Agricultural Health (www.gpcah.org) and the Grain Handling Safety Coalition (www.grainsafety.org) have many training resources and templates for farms of all sizes.

No matter the age or size of bins on your farm, take the time to think through your grain handling procedures. We lose too many lives in these preventable events.

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