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Engulfment on the rise in recent years

By Kim McMichael Apr 11, 2026

Record harvests, larger storage facilities and fast-moving equipment are all contributors to the increase in grain entrapment incidents.

IFT file photo

Grain engulfment and entrapment has been a hazard associated with farming for decades.

Despite the understanding that entering a grain bin can result in injury and even death, the number of incidents involving engulfment and entrapment are on the rise.

Record harvests, larger storage facilities and fast-moving equipment are all contributors to the increase in incidents.

It is important for us to remember that anyone who enters a grain storage structure or climbs into an outdoor grain storage pile risks becoming engulfed or entrapped. As with any hazardous situation, avoid or eliminate the risks whenever possible and be sure that workers are thoroughly trained to manage the situation.

Entrapment risks

Around 80% of reported engulfments involve a person inside a bin or storage structure while grain-unloading equipment is running.

Conveyors or augers remove grain through the bottom outlet, resulting in a funnel-shaped flow on the surface of the grain. Anyone standing on the surface while grain is being removed is at risk of being pulled down in the flowing grain.

Flowing grain is very dangerous and can behave like quicksand. In just 20 seconds, a full-grown adult can become completely buried in grain, and the force required to remove a person buried under grain can exceed 2,000 pounds.

If grain unloading equipment is not shut off, victims can be pulled into machinery or asphyxiate.

Another engulfment risk is bridged grain. This occurs when spoiled grain clumps together and develops a crust on the top surface. This crust appears solid, but it can often hide open spaces that develop as grain is removed. Bridged grain may be unstable and collapse under a person's weight, resulting in the victim being buried by falling and shifting grain.

Vertical grain wall avalanches occur when spoiled grain form a clumped mass that sticks to the vertical wall of the grain bin. Entering a bin to dislodge the grain is especially dangerous when the wall of grain is higher than the person entering the bin. This is because the grain wall can suddenly break loose and fall.

Grain vacuums being operated while someone is inside of the grain bin is another cause of fatal engulfments. When the grain vacuum nozzle is placed below the grain surface, a funnel of grain develops. The operator can be pulled into the downward flow of grain if this nozzle is released or becomes buried below the grain surface near the operator's feet.

The tube can be difficult to maneuver, which increases the risk of the operator losing their balance. If they fall or struggle for position, these movements can trigger an avalanche of the grain if the slope is steep.

Preventing engulfment

The best way to prevent grain bin engulfment incidents is to eliminate the reason for entering the bin at all and restrict unauthorized access by individuals who may be unaware of the hazards.

One critical way to do this is by managing grain to prevent spoilage. Maintain aeration equipment and survey the structure prior to storing season to ensure there are no roof leaks. Store grain at the correct moisture content and temperature to prevent grain from spoiling.

Work from outside the bin if clumps or crusts develop in the grain. One way to do this is to use a pole from outside the bin to knock the clump free.

Post signage and lock access doors for grain bins, storage structures and outdoor grain storage piles. This will help prevent unauthorized people, bystanders and youths from entering the grain storage. Signage should be at all entry points, warn of potential engulfment and state entry is only permitted to trained workers following safe procedures.

If entry is absolutely necessary, it is vital that workers are trained on grain storage hazards and risks involved with entering a grain storage bin or facility.

Training should include recognizing grain quality problems, entry procedures, use of safety equipment and emergency response. Training should be completed before allowing access to a bin or structure and performed at regular intervals.

The policy for grain bin entry should include a lock-out tag-out program. All equipment needs to be shut down and the power sources locked.

When entering a grain bin, there must be two outside observers to monitor entry and assist by regulating a lifeline tether. One attendant must maintain constant visual monitoring of the entrant and have a system of communication worked out before entry.

Be sure the entrant wears fall-restraint equipment that is properly anchored.

Never allow untrained workers or youths under the age of 16 to enter the grain bin.

An emergency rescue plan needs to be in place and followed. This plan should include cell phones on site, numbers for emergency responders posted, and preventing other workers from entering the grain bin. Another person entering the grain bin to attempt a rescue could increase grain pressure on a victim or the rescuer might become engulfed themselves.

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