

NIOSH Warns Farmers of Deadly Risk of Grain Suffocation

NIOSH UPDATE:

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According to the National Institute for Occupational safety and Health (NIOSH), grain farmers and their families may face deadly hazards this spring when working with grain bins. At least nine farmers recently suffocated to death in stored grain after being buried alive.

"We must act to prevent this tragic loss of life. The harvest should yield life, not take it away," said NIOSH Director, Dr. J. Donald Millar. NIOSH warns workers that the risk of being suffocated in grain may be higher this year than usual. A particularly wet fall coupled with a large 1992 crop means the grain was stored wet and may be stored longer than is typical. Moisture can cause the grain to cake or crust at the surface (frequently termed bridging). Bridged grain is extremely hazardous because it prevents grain flow and hides underlying pockets in the grain. Farmers walking on the bridged surface or attempting to break up the bridged material have fallen through the surface and become engulfed in grain.

Farm workers may also be buried by stored grain while the grain is being emptied from the bottom of the bin. Much like quicksand, the flowing grain can pull the worker completely into the bin. The force created by the unloading grain is so great that once a person is waist deep in the grain, he or she is unlikely to be able to escape, even with the aid of a safety rope. Typical unloading rates will bury a person in less than a minute. Another serious hazard may occur if grain cakes along the bin walls. When workers try to break the caked material loose from below the level of grain, large sections of grain may break off, burying them below.

The risk of suffocation increases if grain spoils, because it give off carbon dioxide, which may displace the oxygen in the bin. Even if a worker is not completely buried, he or she can suffocate because of the lack of oxygen above the grain surface.

The following page describes the deaths of nine workers who lost their lives after either falling through crusted surfaces on the top of stored grain or suffocating in grain as it was emptied from a storage bin. To prevent future deaths, workers must be told of the hazards they face and the methods for preventing injury and death. A 1987 NIOSH "Alert" describes these methods, which are summarized on the following page. NIOSH urgently requests your assistance in disseminating this information to workers at risk.

Preventable Deaths

The following workers have suffocated recently in grain bins. NIOSH hopes that future injuries and deaths will be prevented by alerting farm workers to the circumstances of these deaths.

Utilize a shield or trench box system designed to protect workers in excavations. On December 1, 1992, a 63-year-old man was helping his cousin load corn into a wagon in West Allis, Wisconsin. He was trying to break a bridge with a metal rod when it collapsed beneath him. He was pulled into 30,000 pounds of corn where he suffocated.

On December 16, 1992, a 35-year-old farmer was found buried under approximately twenty-five feet of corn in Mount Auburn, Iowa. He had been working alone, moving corn from a converted silo into a grain dryer. He had apparently fallen into the grain while attempting to dislodge bridged grain with a length of angle iron while the grain auger was still running.

On December 18, 1992, a 32-year-old man was found dead beneath 60,000 bushels of corn on his family's farm in Worthington, Minnesota. He was loading trucks from a grain bin and had gone into the bin to check for clumping. He apparently got caught in the flow of corn and was buried beneath it.

On January 1, 1993, a 52-year-old farmer dies while making repairs inside a grain bin in Manning, Iowa. He apparently suffocated when he fell through bridged material and was buried in the grain. The auger was turned off at the time, and no grain was being emptied.

On January 25, 1993, two men (aged 22 and 23) and a coworker were attempting to restore the flow of corn in a clogged 30,000-bushel corn bin in Scotch Grove, Iowa. After climbing one-by-one on top of the grain in the bin, the surface on which they were standing collapsed into a hollow pocket below, burying them both. The coworker was able to escape and call authorities, but attempts to rescue the two victims were unsuccessful. The auger was turned off when the incident occurred.

On January 26, 1993, a 27-year-old man from Brazilton, Kansas suffocated when the grain at the top of a milo bin collapsed under him as he was trying to break up clumped grain.

On February 19, 1993, a 30-year-old man from Redfield, South Dakota suffocated in a corn bin. He and his brother were having trouble emptying a 20,000-bushel bin. The corn was wet and he had gone into the grain bin to unjam the auger. He was sucked down into the corn and completely covered. He had a safety rope tied around him at the time.

On March 23, 1993, a 75-year-old Admire, Kansas man suffocated in a 20 foot milo bin. He apparently fell while trying to loosen grain at the top of the bin.

Steps for Prevention

The following precautions must be taken when working with grain bins.

Break up surface crusts from outside the bin. Surface crusts may be broken through the roof door with a weighted line or a wooden, plastic, or other pole that does not conduct electricity. Conductive poles should not be used, since they may contact power lines near the bin.

Contact your state extension specialist to find out the availability of additional equipment for your bin. Some storage bins can be modified to include equipment capable of mechanically breaking up bridges and clumping. Commercially available equipment and services are also available to assist in breaking crusted grain surfaces from outside of the bin, but the safety of these devices has not yet been determined.

DO NOT ENTER STORAGE BINS! If you **MUST** enter a bin, take the following precautions:

Stay above the material at all times and never stand on top of stored material. Assume that all stored materials are bridged and unstable. The potential for entrapment and suffocation is constant. Never enter a storage area from the bottom when material is caked to the sides of the bin or is bridged overhead.

Wear safety belts or harnesses equipped with properly fastened life lines that will keep you above the stored material in case of a fall. A similarly equipped standby person should be stationed outside the area. This safety equipment will not protect a worker if he or she falls below the level of stored material.

BEFORE entering the bin: Stop the flow of grain. The bin should not be loaded or unloaded while a worker is inside. All equipment used to fill or empty a bin should be turned off and locked out to prevent other workers from starting the equipment.

The bin should be thoroughly ventilated with unheated air prior to entering the bin and while the worker is in the bin. For information about this or other occupational safety and health concerns, call toll free: 1-800-35-NIOSH.

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