



The Lone Star

Agricultural Safety & Health Newsletter
Biological & Agricultural Engineering Department - Texas A&M University

Flowing Grains

Objective:

Make participants aware of the risks of suffocation present in grain bins, silos and gravity flow wagons.

After this Lesson, the Student Should be Able to:

1. Recognize dangers present in various grain handling equipment, specifically grain bins and wagons.
2. Identify how to prevent or avoid dangerous situations in grain handling.
3. Analyze an accident situation and proceed safely.

Grain Bin Model Demonstration

Preparation:

1. Assemble the following materials: Two 2-liter soft drink bottles, tornado tube, model grain bin, grain, action figure (3 or 5 inch) and large trash can (or other container to catch grain).
2. Fill one 2-liter soft drink bottle 3/4 full of water and attach with a tornado tube to form an hour glass.
3. Set up bin a table with catch container underneath.
4. Fill bin with grain.

Procedure:

1. Ask participants if they have watched grain flow from a wagon or bin. Ask them to describe what happens.
2. Show participants the pop bottle filled with water.
3. Demonstrate how a vortex should form. Swirl the bottles in a circular motion and invert so the full bottle is on top.
4. Ask participants to explain what happens. (A vortex or "tornado" forms.)
5. Explain to the students that a similar thing happens in flowing grain, causing a person to be "sucked" under the surface of the grain.
6. Show participants the model bin filled with grain.
7. Place the action figure in the center of the bin and open the slide to allow grain to flow from the bottom pulling the action figure under the surface of the grain.
8. Let participants experiment with placing the figure at different locations in the bin and watching what happens.
9. Discuss with the participants some safety precautions that can be taken with flowing grain. Stress keeping out of the flowing grain!
10. It only takes two or three seconds to become helpless in flowing grain. Within another 10 seconds a person can become completely submerged.
11. Never enter a grain bin while the unloading auger or suction tube is running. If entry is essential, use lifeline and the "buddy system."

12. Never walk on stored grain or play in grain bins.

Grain Entrapment Demonstration

Preparation:

1. Assemble the following materials: Livestock water tank, grain, rope, 3/4-inch plywood disks (24" in diameter).
2. Attach rope to the plywood disk.
3. Place disks on bottom of water tank.
4. Fill tank to a depth of at least 30 inches with grain.

Procedure:

1. Ask participants if they have ever tried to pull a bucket free that was buried in grain.
2. Ask them if it was difficult to do.
3. Show students the grain tank and rope.
4. Explain that the ropes are attached to a disk of plywood (it is a good idea to have an additional disk to show them).
5. Discuss grain entrapment.
 - Invite students, one at a time, to climb on top of the grain and attempt to pull the disk out.
 - Discuss the difficulty of trying to free a person trapped in grain.
6. Discuss some procedures to use when helping a person trapped in grain.
 - Call for help - tell emergency dispatcher what is wrong so they can send the right equipment.
 - Always assume trapped victim is alive.
 - Never start an unloading auger or open a gravity flow gate - victim can be drawn into the auger or become wedged in the opening.
 - Have someone help you turn on bin aeration fans (making certain the dryer heat is not turned on) to provide as much air as possible to the victim. The extra air has been credited with saving several lives in grain bin rescues.
7. This setup can be dismantled at the end of the program - pull the disk free to show participants that the activity is not rigged.