# MIOSHA Fact Sheet

## Consultation Education & Training Division

# Agricultural Industry

# Confined Space Hazards

### What is a "confined space?"

Confined spaces are common to most farms. Such spaces, because of their configurations, hinder the activities of employees who must enter, work in, and exit them. These spaces may contain substances that may create a deadly atmosphere in the space or equipment that poses a threat to the safety of those entering the space.

While MIOSHA currently has no standards addressing confined space entry when performing agricultural activities, other MIOSHA standards (MIOSHA Parts 90 and 490, *Permit-Required Confined Spaces) define* a confined space as any space which:

1. Is large enough that an employee can bodily enter and perform assigned work; AND
2. Has a limited or restricted means for entry or exit; AND
3. Is not designed for continuous employee occupancy.

### Why be concerned about confined spaces on the farm?

Fatal accidents and serious injuries have occurred during work in confined spaces when people have entered for various reasons (e.g., to make a repair, to retrieve something, or to perform any other task without realizing that the space contained a dangerous atmosphere). Some accidents claimed more than one person when would-be rescuers, who were not properly trained or did not have proper rescue equipment, also died.

### Avoid working in confined spaces!

The first rule for preventing these accidents is always to **aim to work outside a confined space and design it so that there is no need for anyone to enter**. For example, you might avoid the need to enter grain silos to deal with

Examples of confined spaces found on farms include grain bins (above) and slurry tanks (right).

bridged material by using rotating flails operated from outside. Similarly, removable pumps eliminate the need for entry into slurry stores to clear blockages. Tanks, vats, and other storage bins should be cleaned from the outside and not entered.

### Common Confined Spaces on Farms and Their Hazards

There are many types of confined spaces are common throughout most agricultural operations:

1. Slurry systems and tanks: All tanks above and below ground, sumps, reception pits, and spaces

under slatted floors present a high risk. Hazards include mechanical hazards (posed by augers) and toxic atmospheres (unsafe concentrations of carbon dioxide, ammonia, methane, hydrogen sulfide, and oxygen deficiency produced by bacterial decomposition of the slurry).

2. Forage tower silos: Hazards may be present in both the silo and its chute. Such spaces primarily contain mechanical hazards posed by the conveyor system and toxic atmospheres (carbon dioxide, nitrogen oxides, and oxygen deficiency).
3. Grain bins and handling systems: Such spaces primarily contain mechanical and engulfment hazards posed by flowing and/or bridged grain, inwardly converging walls, and toxic atmospheres (carbon dioxide, pesticides, and oxygen deficiency).
4. Tanks, vats, & other liquid storage containers: Hazards can varying depending on the contents, but most generally include oxygen deficiency, toxic atmospheres, and engulfment concerns. A recent fatality in Michigan involved the cleaning of a molasses storage tank. As a result of the fermentation of the molasses, a non-respirable/oxygen deficient atmosphere in the tank led to the death of two employees.
5. Fruit and vegetable stores: These present a hazard as carbon dioxide is used to aid storage of the fruit for prolonged periods: Such spaces can be defined as a confined space once they have been sealed and filled with carbon dioxide, thereby possessing an oxygen deficient atmosphere.

Again, never enter a confined space without proper training and until the atmosphere has been verified as safe for entry and all other hazards have been assessed and properly eliminated.

## Employee Training

Training of employees in the identification of and hazards located in confined spaces can significantly reduce the risk of serious injury or death in such spaces. Such training should stress that death is the likely outcome if proper precautions are not taken before entry is made.

## Fatality Prevention in Confined Spaces

Agricultural employers should assess their farm for the presence of confined spaces and, if any are identified, inform their employees of their presence through the use of signage and/or employee training.

Prior to entry of a confined space, it should be evaluated by someone knowledgeable with the site's confined spaces, their hazards, and the necessary equipment and procedures to ensure their safe entry. Tests should be made for oxygen level, flammability, and known or suspected toxic substances.

Evaluation of the confined space should also consider the following:

- The presence of any engulfment potential;
- Any inwardly converging walls located in the confined space;
- The elimination of all pneumatic, hydraulic, and electrical energy sources and proper institution of lockout/tagout procedures;
- Cleaning and/or purging of hazardous substances from the space;
- Ventilation of the space when necessary to maintain acceptable air quality;
- Proper usage of safety lines attached to the person working in the confined space and the use of standby personnel to maintain contact with the entrant;
- Personal protective equipment (e.g., clothing, respirators, boots, etc.);
- Special tools required for entry;
- Work procedures to be performed in the space;
- Emergency response procedures; and
- Any other acutely hazardous safety or health threats.

## MIOSHA CET Services

The best protection against farming fatalities is to develop a safety and health system that reduces the risk of farm injuries, illnesses, and fatalities. A key component is the recognition, control and prevention of hazardous working conditions. For information on developing a safety and health system, contact the Consultation Education and Training (CET) Division at 517-284-7720 or visit their website at **www.michigan.gov/cet**.

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