
Manure pit fatalities spur awareness

Toxic gases among the invisible hazards on a farm

PUBLISHED ON AUGUST 23, 2021



Before anyone enters a confined space on farms such as manure pits, silos or septic tanks, the gases inside should be monitored.

HENRY, Ohio — Among farmers, one family's tragedy can feel like every family's tragedy.

On Aug. 10, three brothers died from the toxic fumes of an underground manure pit on their family's farm, sending shock waves across the agricultural community well beyond St. Henry.

The eldest brother stepped into the underground tank first. He went in to fix a problem with a pump. When he was overcome by a toxic mix of gases and passed out, another brother called for help before rushing in to try to rescue his brother. Then a third brother went in to try to save the other two.

One by one, they all succumbed to the gases. One by one, they passed out, landing in the standing liquid, a tragic domino effect: Gary Wuebker, 37, Brad Wuebker, 35, and Todd Wuebker, 31.

Three brothers dying on the very same afternoon has many asking what can be done to prevent future deaths from the not-so-obvious invisible risk of poisonous gases that can build up on a farm.

"Everyone is just dumbfounded, in a daze, just trying to wrap their head around the whole thing," said Denny Riethman, an educator with Ohio State University Extension in Mercer County, where St. Henry is located.

"God had a plan. He needed three strong boys, I guess. Whether we'll ever understand why they were taken, I don't know."

To try to prevent future similar tragedies, OSU Extension, the outreach arm of The Ohio State University College of Food, Agricultural, and Environmental Sciences, will host training beginning this fall promoting safety in and around manure pits and other areas that generate harmful gases.

Invisible threat

The threat those gases pose may not be obvious, and the impulse is natural for someone to go in to try to rescue a father, brother, coworker, or even a stranger. Yet, like running into a burning building to get someone out, going into a confined space with toxic gases, without an oxygen mask, can come with the risk of dying.

Over the decade between 2010 and 2019, 16 people died in confined areas on Ohio farms. Of those, six were related to manure lagoons or pits.

As manure breaks down, the main gases it produces are hydrogen sulfide, carbon dioxide, methane, and ammonia. All of them can be poisonous at certain levels, with hydrogen sulfide being among the most toxic. Just a few breaths of hydrogen sulfide-contaminated air can affect someone exposed to it.

Testing before going in

Before entering a manure pit or any other confined space where gases can build up, it's critical to test the air with a gas monitoring system, said Dee Jepsen, state safety leader for OSU Extension. A long probe on the gas monitor allows someone to test the level of oxygen without going inside.

For air to be safe to breathe, it must contain at least 19.5% oxygen. The ideal oxygen level is at or above 20.9%. If the oxygen level is between 14% and 17%, it can trigger impaired judgement, dizziness, fatigue, and collapse, Jepsen said.

"Even if you entered that space and nothing bad happened before, doesn't mean the next time you enter, the conditions will be the same," she said.

If a test shows the manure pit doesn't have enough oxygen to go inside, the pit can be ventilated and tested hours or days later.

When a monitor indicates the air in the confined space has enough oxygen, someone can enter a manure pit but should do so carrying the gas monitor.

"The conditions can change," Jepsen said. "Carrying the monitor in the pit will keep you continuously updated on the status of the air."

The person entering the confined space should wear a harness, she said. That way if he or she passes out or struggles, another person who is standing by watching can reel him or her up out of the pit.

Rushing in

Sometimes panic or an urgency to help causes a person to rush into the toxic area to rescue someone.

On average, 60% of deaths on farms that happen in confined spaces involve the people who tried to rescue someone else—a family member, coworker, or a rescue worker without the proper equipment, Jepsen said.

Underground pits and above-ground manure lagoons collect manure so it can later be pumped out and used as fertilizer on crops. To do that, manure pits and above-ground manure lagoons must be agitated periodically to keep the liquid manure from becoming solid and crusting over, making it more difficult to later pump out. But the agitation releases toxic gases into the air.

"It's like a can of soda sitting on my desk that's not open. If I shake it and pop the top, it fizzes out," Jepsen said. "When we wake up a sleeping manure pit by agitating it, the very first releases of gas contain a lot of deadly gas."

Stirring up gases

So, farmers working near manure lagoons—even in the open air—need to be cautious when the manure is agitated.

Gases can also build up in water tanks, pits and sumps, wells, cisterns, and septic tanks. Waste and sewage pits can create hazardous atmospheres with low oxygen levels or pockets of toxic gases that are unsuspecting to anyone who enters. And cleaners used on some farms can produce toxic gases.

Being invisible, gases may not seem like threats compared to other farm hazards, which is why some people may not see the need to monitor the gases so closely, Jepsen said.

"When working in these environments where oxygen can sometimes be limited, we must always monitor the gases—even if we don't suspect a problem."