



September 2019

National Farm Safety & Health Week

Each year the third week of September is recognized as National Farm Safety and Health Week. As we prepare for manure application, take some time to review safety practices to help keep you and your employees safe this fall.



Manure foaming – Causes, safety, and management

Spontaneous foaming in swine manure pits is an ongoing challenge and has serious potential danger. Methane gas is trapped in the bubbles and creates the potential for fires and explosions, especially when the foam bubbles are rapidly destroyed and a spark occurs. Conditions are especially dangerous during agitation, pumping, or pressure washing or activities like welding and hot work where slag might fall into the foam. If you are dealing with foam, make sure you take the appropriate precautions to ensure safety for you, your employees, and your pigs. Below are a few

best tips for working with foam, or check out this video for a refresher on dealing with foam.

- Provide continuous ventilation to prevent gas build-up. Increase ventilation during agitation to quickly dissipate released gases.
- Turn off heater pilot light and other non-ventilation electrical systems, such as the feeding system)
- When pumping pits that are close to being full, pump without agitation until manure is about 2 feet below the slats.

Leon's Safety Message:

Leon Sheets shared his story of a fire/explosion at his swine barn, which occurred on September 15, 2014. His message reminds all of us, the importance of safety. "Farmers need to be careful whether they are pumping, power washing, or doing maintenance when it comes to these accidents, we want no more, nobody else." Take the time to hear [Leon's message](#).

If you'd like more information on what the research on foaming showed, check out [The Manure Scoop](#).

Manure Agitation Tips for Hydrogen Sulfide Safety

Hydrogen sulfide gas continues to be a serious issue both in and around barns with liquid manure storages. The decomposition of organic matter in manure results in the release of several gases, ammonia, carbon dioxide, methane, and hydrogen sulfide among them. Most of the time these gases are emitted slowly, but any time manure is being agitated, pumped, or the surface is disturbed, hydrogen sulfide can be rapidly released. Although all are potentially dangerous, hydrogen sulfide tends to be the one of most concern in these cases. Hydrogen sulfide has an intense rotten egg smell, so it is relatively easy to detect its presence, even in very low concentrations. However, since we can smell it at such low levels, there is not a clear indication of when it reaches potentially hazardous conditions that we can detect without the use of analytical instruments.

Hydrogen sulfide can spike quickly and without warning during pit pumping.

People should NEVER enter a building or facility while agitation is occurring. Use yellow caution tape to mark barn entrances and alert everyone that

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manure agitation and pumping is occurring. [Consider lockout tags during pumping.](#) If possible, remove animals before pumping. For barns with multiple pits move cattle out of the room with the pit being agitated to reduce risk.

Agitation Strategy

- Don't agitate until manure the manure level is 1 ½ to 2 feet below the slats.
 - Hydrogen sulfide is denser than air and as a result, will tend to pool on the manure surface, sufficient separation is required to minimize hydrogen sulfide in the animal breathing zone
- Avoid aggressive agitation when animals are in the building (no rooster tailing).
 - Surface agitation causes more turbulence and greatly increases the release of hydrogen sulfide
- Do not direct agitator nozzles toward pillars, walls, or towards a corner.
 - Pillars and walls stop flow quickly and cause the manure to churn, increasing the rate of hydrogen sulfide off-gassed from the manure.
 - Corners are often dead air zones; releases off hydrogen sulfide in this area are more likely to result in animal loss
- Stop agitating when the bottom nozzle is less than 6" below the manure surface.
 - Keep the agitation below the surface at all times.
- Avoid sudden changes in agitator depth and intensity.
 - Quick changes can result in large amounts of solids that haven't previously been agitated and result in rapid gas release.
 - Slower changes in power, flow direction, and depth allow slower, more continuous release that is safer for animals and workers.

Consider purchasing a gas monitor. Monitors, which provide alerts or real-time levels, notify the operator when concentrations levels reach a point when supplemental ventilation is required or when agitation practices should be modified.

The publications below provide more information about monitoring options and best management practices for ventilation and agitation.

- [Hydrogen Sulfide Safety - Monitoring](#)
- [Hydrogen Sulfide Safety - Manure Agitation](#)

- [Hydrogen Sulfide Safety - Swine Barn Ventilation](#)
- [Barn Ventilation at Cattle Facilities](#)



Figure 1: Adding pump out curtains during manure agitation helps limit air exchange of hydrogen sulfide near the applicator.

The Manure Scoop

In this month's Manure Scoop, as application season begins we are going to take a look at some [nitrogen budgets for different application timings](#). Previously I've talked a bit about the [science behind 50 and cooling](#), and while that is a start, sometimes it is useful to dig in a little deeper on what we see.



Figure 2: Reduce potential nitrogen loss by waiting to apply manure until soil temperatures are 50°F and cooling.

Events

[Manure Phosphorus Inventories at Various Scales Webinar](#)

September 20, 2019, 1:30 pm

Integrated Crop Management Conference

December 4-5, 2019

Ames, Iowa