

Got Gas?

By Dan West

Silo gas, that is. It's the time of year again to be reminded about the deadly hazards of the oxides of nitrogen produced by silage "working" or fermenting. Any time a large amount of green vegetation is chopped and packed together, enzymes cause a chemical change which gives off gaseous by-products including nitrogen dioxide. Nitrogen dioxide (NO₂) displaces oxygen and, when it contacts moisture as it does in the lungs when breathed in, forms a very strong acid, nitric acid, which can severely burn the inside of the lungs. Nitrogen dioxide is heavier than air and, in large concentrations, can smell like household bleach and appear as a yellow or orange cloud. Being heavier than air, it settles to the lowest point. It is strong enough to peel paint from nearby machinery.

Plants, such as corn, draw nitrogen up through their roots from the soil, and some is stored in the plant. The bottom 10 or 12 inches of a corn stalk is particularly high in nitrogen content. In a dry year, plants seem to store a greater amount of nitrate making the threat of nitrogen dioxide production even greater. Gas production builds to a dangerous level within two to four hours of ensiling chopped forage. Production peaks at about three days, continues for about two weeks, but remains present for up to four weeks. During this period of time, you should not enter the silo for any reason! Even after that, for your safety, you should run the forage blower for an hour to thoroughly ventilate the silo before entering,

It seems that nearly every fall we hear about someone who has sustained severe lung damage or has been killed by silo gas. Here are some procedures that, if followed, will greatly reduce YOUR chance of becoming a victim this year.

Detecting the gas:

- If silage has been undisturbed in storage for more than two hours, but less than four weeks, there is probably some nitrogen dioxide present.
- Being heavier than air, it will be in the lowest point of the silage, will move down the silo chute, and settle near the floor of the silo room. If dead rodents are present, seal off the room and stay out.
- A yellow, brown, reddish, or orange cloud or a bleach-like odor indicates a high concentration and is a sure sign to stay away! This can even be present at the opening of large ag bags of silage and bunk silos, too.
- If, when near a freshly filled silo, you experience a burning sensation in your nose or throat, you are in serious trouble and should quickly leave the area and get into fresh air. Exposure to a heavy concentration can result in immediate DEATH!

Preventing exposure:

- Don't over-fertilize fields with manure and keep fields as weed-free as possible. Harvest hail or frost damaged crops as soon as possible to avoid build-up of excess nitrate.
- Cut corn high, at least 12" high in a dry year to avoid the greatest concentration of nitrate in the stalk. Try to avoid harvesting immediately after rain.
- Use a silage distributor to level silage in the silo so you don't have to go in. If you do have to go in, do it immediately after filling and with the forage blower running to provide ventilation.
- Ventilate the feed/silo room so gas doesn't build up during to four weeks after filling the silo. Guard against the gas entering the stable area.
- Post "DANGER – DEADLY SILO GAS" signs around the base of the silo to warn visitors, family members and workers to stay away.
- No dust mask will protect you from inhaling this gas.
- DO NOT attempt to rescue someone who has been overcome inside a silo – you will be the next victim. Call for knowledgeable help. Rescue can only be attempted with self-contained breathing apparatus and lifelines.

If you think you have been exposed to silo gas but are still able to move:

- Get to fresh air immediately. Sometimes the symptoms of shortness of breath or coughing don't appear for several hours after exposure. Seek knowledgeable medical help immediately.
- If your doctor is not familiar with diagnosis and treatment of silo gas exposure, Dr. John May, Director of NYCAMH and preeminent authority in agricultural respiratory diseases can be reached by calling 800-343-7527.
- Bassett Healthcare operates a Farmers Clinic in Cooperstown. If you would like to make an appointment at the Farmers Clinic, call 800-343-7527.

If you have any questions regarding the threat of silo gas exposure and its consequences, please call the New York Center for Agricultural Medicine and Health (NYCAMH) in Cooperstown, New York at 800-343-7527. We are here to promote safe and healthy farming for you.