



**THE OHIO STATE UNIVERSITY**

COLLEGE OF FOOD, AGRICULTURAL,  
AND ENVIRONMENTAL SCIENCES

## **Hardin County Extension News Release**

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### **Vomitoxin in Corn Grain Bins**

*Hardin County* – Currently there is a lot of activity unloading grain bins and hauling corn to market. Cash bids are very good, the weather has broken after several weeks of cold temperatures and snow, and we have begun a new tax year for farmers. Considering the harvest of 2020, some producers may experience vomitoxin in their bins when unloading and cleaning out this past harvest's corn crop. Since this week has been Nationwide Insurance Grain Bin Safety Week, this article will draw attention to on-farm and other grain storage safety when working with corn that has high levels of vomitoxin.

Some localized areas of Ohio experienced fields with Gibberella ear rot (GER) that was more than likely contaminated with mycotoxins. Infection of the ear, development of visual symptoms (ear rot), and contamination of grain with vomitoxin all depend on weather conditions during the weeks after silk emergence. Once the fungus enters the ear via the silks (infection) and begins to colonize the developing grain, it produces vomitoxin, even if subsequent weather conditions are not favorable for mold and ear rot to develop on the outside of the ear. This is particularly true if infections occur late and conditions become relatively dry and unfavorable for visual symptoms to develop.

Local markets such as ethanol plants, feed mills, and grain elevators test for vomitoxin levels in parts per million. Depending on the end use of the corn, these buyers will discount or reject loads at set levels of contamination. These levels increase with processing of the corn; and can cause significant issues when feeding to certain types of livestock. Severely diseased and toxin contaminated grain are usually smaller than healthy grain and covered with fungal mold. Compared to healthy grain, diseased grain kernels break easily during harvest, transport, and other forms of grain handling, increasing the number of fine particles and the amount of dust in the grain lot.

In the fall, it is recommended that fields with ear rot problems should be harvested as soon as possible and handled separately from healthy fields, even if it means harvesting those fields at a higher-than-usual moisture content. Adjusting the combine to minimize damage to the grain and increasing the fan speed will help to remove lightweight grain and dust particles, and as a result, reduce the level of mycotoxin in the grain. Once harvested, grain should be dried down to below 15% moisture with storage in a clean dry bin.

Unfortunately, there are no commercially available treatments to reduce vomitoxin levels in stored grain. Poor storage may cause toxin levels to increase. Warm, moist pockets in the grain promote mold

development, causing the grain quality to deteriorate and toxin levels to increase. Aeration is important to keep the grain dry and cool. However, it should be noted that while cool temperatures, air circulation, and low moisture levels will minimize fungal growth and toxin production, these will not decrease the level of toxin that was already present in grain at the time of storage. When selling grain, corn that has been tested with vomitoxin should be sold as soon as possible.

Dry and store harvested grain to below 15% moisture or lower to minimize further mold development and toxin contamination in storage. Store dried grain at cool temperatures (36 to 44°F) in clean, dry bins. Moderate to high temperatures are favorable for fungal growth and toxin production. Periodically check grain for mold, insects, and temperature. If mold is found, send a grain sample for mold identification and analysis to determine if toxins are present and at what level. Clean bins and storage units between grain lots to reduce cross-contamination.

Harvesting and handling moldy grain may expose farmers to mycotoxin and other moldy conditions in the grain dust. Dust in grain harvested from GER-affected fields contain a mixture of tiny pieces of grain, husks, and cobs, all of which may be contaminated with vomitoxin, as well as pieces of fungal mycelium (mold). In fact, husks and cobs are usually more contaminated with mycotoxins than the grain. Breathing grain dust can have adverse effects on the human respiratory system. When the dust is also suspect of mycotoxins, it is especially necessary to take precautions.

Wearing a disposable, 2-strap N95 mask (respirator) helps protect the worker from breathing in dusty, moldy and toxic substances. This type of personal protection equipment will filter out at least 95% of the dust and mold in the air. The 1-strap mask does not have this level of protection, and is basically worthless in agricultural environments. The COVID-19 pandemic has made it difficult to purchase the recommended respirators for agricultural work. The suppliers have increased manufacturing of these items; however, some local outlets are still limited in their product availability due to an increased need to service medical personnel.

If disposable masks are not available, consider a reusable quarter face mask with interchangeable cartridges. P100 filters may be more readily accessible for online purchases. Quarter masks, with replaceable cartridges, may also be more economical in the long term because of their multi-functional applications in agricultural settings. Either an N95 or P100 respirator are the best forms of protection from moldy and dusty grain dust. Protect yourself and all workers exposed to grain dust while both harvesting and handling suspect corn.

For more information on respirators for farm use, consult the OSU Extension Factsheet: Dust and Mold, AEX 892.2.11 <https://ohioline.osu.edu/factsheet/aex-892211>

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