

IOWA STATE UNIVERSITY

Extension and Outreach

Integrated Crop Management

Flooding and Stored Grain

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The rapid snowmelt in Spring 2019 has caused instances of stored grain being covered with floodwater. By current Food and Drug Administration (FDA) policy, grain inundated by uncontrolled river or stream water is considered adulterated and must be destroyed. The situation in 2019 is one of river water flooding rather than of rain-driven pooled water in low ground, for which there are salvage options. As shown by the example of the inundated Omaha sewage treatment plant, river-based floodwaters can bring in many hazards and rapid spoilage.

Flooding affects both the stored grain and the storage structures. Try to move the grain before the flood reaches the bin, but stop using underfloor conveyors and legs once the water starts entering the pits.

Grain and Grain Products

Flood damaged grain is adulterated grain because of the potential for many contaminants to enter through the water. This grain should be destroyed, never blended. Contact local Department of Natural Resources (DNR) officials for the best disposal process in your area. The recent Food Safety Modernization Act has increased public awareness of food and feed related hazards.

Water coming up from tiles and pits is just as suspect because storm and sanitary sewers are usually compromised in floods. Even field tile water may contain animal waste products, high chemical levels and other contaminants.

Corn will stay at about 30 percent moisture after the water drains off; soybeans about 25 percent moisture. The moisture won't travel more than a foot above the flood water line.

Remove good grain on top of flooded grain from the top or side, not down through the flooded grain. The reclaim conveyors and pits under bins contain flood water as well. Remove all the good grain before doing anything with the bad portion. The good grain is still suspect which is why FDA must evaluate the situation on a case-by-case basis before it can be sold into any uses.

Do not start aeration fans on flooded bins. Have the entire structure and related electrical components inspected by a qualified electrician, to verify that nothing is still energized, before taking action to salvage the grain. Use professional salvage operators that will take correct safety precautions for bin entry.

Mold toxins are likely in rewetted grain. Warm wet conditions are ideal for mold growth. Moldy grain is a safety hazard. Use precaution and wear protective equipment when working with moldy grain. Grain will be moldy by the time the water has receded.

Take care not to track or mix mud or gravel from flooded grounds into good grain during salvage operations. These materials are potentially toxic for the same reasons as the floodwaters.

Structures

Grains swell when wet so bin damage is likely; more so with soybeans. Bolts can shear or holes can elongate. Look for signs such as stretched caulking seals, doors misaligned or similar structural problems. Farm bins typically have lighter-grade steel and fasteners than commercial bins. Stay aware for signs of failure when working around bins containing wetted grain. Check bins with stirring devices carefully. The bin must be perfectly round for them to work correctly.

Bin foundations can shift, float or deteriorate from flooding. Inspect structures and foundations carefully, and have an engineering evaluation for larger bins.

Expect electric wiring, controls, motors and fans to be ruined. Do not energize wet components. Be sure the power is off and locked out before touching any electrical components of flooded systems.

Wood structures will be hard hit and may retain mold and contaminants.

Clean and disinfect facilities and grounds completely. Then do a careful food safety inspection before returning facilities to operation. A third party inspection is recommended. Maintain records of cleaning.

Action Checklist

1. Cut all power and professionally verify that all structures are not energized.
2. Determine where the water line was, and therefore the extent of adulterated grain.
3. Consult your insurance carrier before moving any grain.
4. Remove good grain from the top or side, collect a 5-10 lb composite sample for Grading by an Official grader (https://www.extension.iastate.edu/grain/files/page/files/usda-fgis_directory_pdf.pdf), including a mycotoxin screening. Off-farm use will require consultation with FDA; contact Keely Coppess (keely.coppess@iowaagriculture.gov) at the Iowa Department of Agriculture and Land Stewardship) for assistance.
5. Consult your local Iowa DNR Field Office for instructions on disposal of adulterated grain.
6. Clean and disinfect storage structures. Replace electrical components.
7. For on-farm feeding of the good grain, develop a use plan in consultation with a veterinarian.

Salvage (for grain in flooded bins but above the water line, and for pooled water inundation)

Evaluation and potential reconditioning for further sale has to be done with the written consent of FDA. For feed on site by owner, producers have three alternatives.

- Dry the grain if needed.
- Feed it immediately to their livestock
- If wet, ensile the grain for future livestock feed, in bunkers or bags.

Feeding should be done under the supervision of a veterinarian. Ensiling may be the best way of protecting quality and palatability of wetter grain.

Decisions need to be made quickly. The good grain should be removed immediately, again not down through the soaked grain. No flooded grain can be sold to any market without approval of FDA, to document its exposure only to uncontaminated (pooled) water, with subsequent reconditioning for an intended use. The flooded grain in 2019 is primarily from river water, which is considered contaminated.

There is no problem, other than spoilage within a day or two, with using uncontaminated soaked corn as a livestock feed. Just replace the corn in the animals' current diet with the wet corn. Remember to adjust amounts fed for moisture.

Wet, whole soybeans can be fed to cattle if the soybeans are limited to 10 to 12 percent of the ration's dry matter. Soybeans substitute well for the protein in soybean meal, but they need to be fed with a vitamin- mineral-additive premix if substituted for a complete protein supplement.

It is not necessary to heat-treat the soybeans for cattle. Also, if adding whole soybeans to diets high in distillers' grains, watch the total ration fat content. For hogs, raw soybeans can only be fed to mature sows. The soybeans need to be heat treated if fed to younger pigs.

Category: [Grain Handling and Storage](#)

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