Minimizing post-harvest grain losses

You select just the right seed for your fields. You nurture the plants with the right mix of nutrients. You invest in crop protection products to keep threats at bay. You take care to harvest when your corn and soybeans are at their ideal test weight and moisture. But with harvest complete, the job isn't quite done. Each year, more than 400 million tons of grains worldwide are lost due to storage issues.[1]

Storage losses can be direct (loss of actual grain weight) and indirect (loss of quality or nutritional value), and can come from living sources (rodents, pests, fungi) and non-living, or abiotic, sources like humidity and temperatures.[1]

With your bushels and dollars at stake, it's important to ensure your post-harvest plan is just as thorough as the approach that brought you great yields during the season. Here are five tips to reduce grain loss after harvest.

1. Start with the right seed selections and treatments

Mycotoxins are responsible for about half of all post-harvest grain losses,[1] but preventing fungal infections really starts in the field. Planting crops that are resistant to fungal diseases and using fungicides when needed will reduce the chances of transferring a fungus to the bin where – if the grain is not stored properly – it can grow and reproduce.[2]

2. Clean, sanitize and treat storage areas

The University of Minnesota Extension warns that even trace amounts of grain left over from prior storage can become a haven for insects and rodents.[3] They recommend cleaning bins, as well as all areas around bins, immediately after emptying.[3] Residual insect treatments may also be useful.[3] Be sure to follow all labels and directions to ensure proper wait times before adding grain to bins to avoid contamination. During cleanup, check for holes, broken seals and other damage to bins and housings to help keep pests out and better control storage conditions.[3]

A surface treatment on grain can deter insects that still make their way into the bin, but won't help if an infestation has already taken hold.[3] If previously-stored grain had a mold or mycotoxin issue, bins should also be disinfected.[2]

3. Thoroughly clean grain

Just as you like to start clean in your fields at planting, when harvest is done, you want to finish clean as well. Run grain through a cleaner to ensure you've removed as much foreign material as possible before storage.[3] Reducing foreign materials gives insects less to feed on and produces better results in dry down and aeration.[3,4] Using a grain distributor is also helpful, because it keeps fine particles from aggregating, which can impede air flow and invite insects.[3]

4. Keep grain cool, aerated and level

Aeration is recommended whenever the temperature of the grain is 10 degrees higher than the air temperature.[2] Aeration helps keep temperatures uniform and inhibits insect activity and mold growth.[2,3] Create an even grain surface when storing, which helps maintain consistent temperatures, allows air to flow more freely and makes inspection easier.[4]

5. Stay vigilant

Check grain periodically for insect damage, moisture and mold.[3] Remember that during different times of the year, insects may be found deeper in the bin.[3] Insect activity will actually raise temperatures in grain bins, causing further complications.[3] Intervals for monitoring your stored grain will vary depending on the season, temperatures and how much the grain has cooled.[3]

[1] Mesterházy, Ákos, Judit Oláh, and József Popp. "Losses in the Grain Supply Chain: Causes and Solutions." *Sustainability* 12, no. 6 (2020): 2342.

[2] Dorn, Thomas. "Grain storage management to minimize mold & mycotoxins." University of Nebraska-Lincoln. Accessed 5 October 2021. https://cropwatch.unl.edu/documents/UNL-Grain-Quality-2012-10-4-2012-Dorn.pdf.

[3] Glogoza, Phil and Dave Nicolai. "Managing stored grain to minimize storage losses." University of Minnesota Extension. 2018. Accessed 5 October 2021. https://extension.umn.edu/corn-harvest/managing-stored-grain-minimize-storage-losses.

[4] Jones, Carol and James Hardin. "Aeration and Cooling of Stored Grain." Oklahoma State University Extension. 2018. Accessed 5 October 2021. https://extension.okstate.edu/fact-sheets/aerationand-cooling-of-stored-grain.html.

Protect against losses DURING harvest

Evaluate the combine: Remove any field trash, oil or grease buildup and rodent nests. Check for loose, worn or missing parts and replace as needed. Inspect all belts and chains for wear and tear.

Prioritize fields for harvest: Identify fields with the potential for loss due to stalk rot, hail damage or other injury and harvest those first.

Prevent grain loss: Eardrop, shatter, improper cutting height or lodging can reduce yield. Grain also can remain on the cob, in the pod or pass through the combine with the residue. Fine-tune your combine settings to avoid these issues.

Reduce harvest speed: A ground speed of 2.5 - 3.5 miles per hour usually produces good results. Slower speeds might be required under poor field conditions.

Estimate yield loss: Place a 1-foot square frame on the ground behind the combine after a pass and count the number of seeds found inside the frame. Do this at least three times and calculate the average. Every four soybeans or two kernels of corn in a square foot represents a 1-bushel-per-acre yield reduction.