Successful Strategies: The True Cost of Storing Grain

Published on Oct 17, 2018 by Peter Isaacson, AFM, AAC

Peoples Company recently published a blog article discussing the effects of recent wet field conditions. During a wet fall, we worry about increased chances of molding, ruts/compaction across the field, and deteriorated grain quality. But getting it out of the field isn't the last step of the production cycle. In this blog article, we will touch on the basics of crop drying and storage as well as the costs associated with it.

If you've spent any time traveling the Midwest landscape, chances are you've seen a grain bin likely full of corn or soybeans. Grain bins are metal structures that serve as a piggy bank between harvest and the selling of the crop. This is often short-term storage while grain prices recover from the increased supply during harvest months. While the act of storing grain may sound simple, there are several preservation factors to take into account while it is scheduled to sit in storage.

Corn and soybeans contain a certain percentage of water, and that percentage goes down as they mature. But with large-scale, modern agriculture there isn't always time for the crop to dry naturally. Farmers are beginning harvest earlier each year thanks to modern drying technology and affordable on-farm storage facilities.

Optimal crop storage moisture varies depending on crop type and length of storage:

- Corn moisture levels need to be 15% for 6 months of storage, 14% until next harvest, and 13% for storage over a year.
- Soybean moisture levels need to be even lower for safe storage, with 13% moisture for winter storage and 11% for 6 plus months of storage.

Improper moisture levels in grain storage facilities can stimulate mold growth, fermentation, and rotting. The worst-case scenario is excess moisture resulting in an anerobic environment that creates hotspots and smoldering of the grain.

While soybeans usually dry naturally, corn is frequently dried at the elevator or on the farm using heat and aeration. If a farmer is harvesting corn at 20% moisture, he needs to remove at least 5 moisture points before it is suitable for storage. Grain dryers use liquid propane burners (LP) and forced air to remove moisture from the kernels.

To understand the costs associated with drying, let's run through the numbers of drying 20% moisture corn. Right now, propane cost on average is $1.00/gal, and the energy to dry one bushel one moisture point is 0.022.

We need to remove 5 moisture points to get the corn from 20% moisture to 15% moisture for storage: $1 x 0.022 = $0.022/bu./point. X 5 = $0.11/bu. This math makes the price per bushel to remove 5 moisture points $0.11 per bushel.

With this figure, 1 acre of corn at 200 bushels/acre with 20% moisture would cost $22.00 to dry down to 15%. If we dry 100 acres, it is $2,200.00, and 1,000 acres would cost $22,000.00.

As yield and moisture go up, so does cost. Cost also rises as target moisture goes down. If you had to dry to 13% or 14% the cost per acre would be higher.

Once the grain is dried to desired moisture levels, it is moved to storage. Grain bins can be expensive to construct, and accurate marketing needs to be in the business plan to ensure the bushels stored in the bin can pay for it. The easiest way to generate return on investment for grain bins is by comparing the cash price for the commodity when it went in the bin, the cost of storing it, and the price it is sold for when it left the bin. Common expenses associated with storing grain include the actual price of the storage structure, interest on stored grain, maintenance and repairs, depreciation, and quality deterioration.

On-farm storage costs can range anywhere from $0.25 up to $0.50 per bushel. If the cash price for corn is $3.05/bu. at harvest, and storage costs are $0.30/bu., the grain needs to be sold for upwards of $3.36/bu. to turn a profit. Just because it's dry and in the bin doesn't mean it's not costing the farmer anything to keep it there.

Running through the agronomic and financial decisions farmers take to get a crop from field to market is just another example of the many decisions made throughout the year. A well-executed plan for the fourth quarter of the year could easily mean the difference between a good year and bad year.