

Storing Corn from the 2010 Harvest: Aerate and Monitor – (Matt Roberts, Grain Quality Extension Specialist and Richard Stroshine, Professor, Agricultural and Biological Engineering Department)

The 2010 corn harvest season has been almost the exact opposite of the season producers experienced in 2009. In 2010 growers and researchers reported almost no field molds and harvest moistures were considerably lower than in years past. Based on conversations with growers around the state, some who started harvesting early had moistures around 25%, while the bulk of the corn was harvested at moistures between 14% and 18%. Although grain drying was not much of a concern for many producers this year, it is still important to minimize the chances of spoilage by applying the basic principles of grain storage, which include aeration and monitoring. There have already been reports of grain in storage going out of condition and in many cases this can be attributed to ignoring those principles.

Aeration: Aeration of grain in storage helps to equalize not only temperature differences, but also moisture differences throughout the grain mass. It is especially important to aerate grain that was taken out of the field and placed directly into storage. While the field average may have been 14% or 15% moisture, there may have been pockets of 16% or 18% moisture grain in the harvested corn. Aeration will help to cool this corn and may move some of the moisture out of those wetter pockets.

This year the temperature of a large portion of the corn was put in the bin at temperatures between 70 and 80 degrees. At such high temperatures there is greater risk that the corn will spoil. Corn at 16% moisture with a kernel temperature of 70 degrees can begin to spoil in approximately 30 days. Therefore as soon as corn is placed in the bin, it should be aerated and, if it was above 70 degrees, the first cooling cycle should begin when the average outside air temperature (average of the daily high and low temperatures) drops by about 10 degrees. Cooling should continue in a stepwise process throughout the fall months and into the winter. A new cooling front should be moved through the bin when the average outside air temperature has dropped another 10 to 15 degrees. Ideally, corn should be cooled to just above freezing using two or three aeration cycles. Grain temperature near the top surface of the grain mass can be determined by placing a thermometer (such as a metallic oven thermometer with a long stem) 1 to 1.5 to feet under the surface of the grain where it is left for about 5 minutes before the reading is taken. If the cooling front has moved through the bin, the temperature of the grain below the upper surface should be the average temperature when aeration was begun. Length of time for an aeration front to move through a grain mass can vary greatly depending on bin and fan size. For a small bin with a large fan it may take only a day for the cooling front to move through the bin. For a tall bin with a smaller fan it may take several weeks for the cooling front to reach the top surface.

Air takes the path of least resistance. Therefore it is important to “core” the bin by pulling a load of the grain out of the bin to level the top of the grain mass. Because of the lower harvest moistures and particularly if combine cylinder speeds were higher than necessary, there may have been higher percentages of broken kernels in the corn. Broken kernels tend to accumulate near the center of the bin and reduce airflow through that part of the grain mass. Coring the bin removes the corn with higher fines. In larger bins it may be necessary to take several loads from the bin to reduce the concentration of fines in the center of the bin.

After aeration is completed for the year the fans should be covered to prevent entrance of outside air and to keep out rodents and pets.

Monitoring: It is necessary to check a bin for signs of spoilage at least once every two weeks during the winter and weekly in the fall and spring when the outside air temperatures are warmer. The suggested way to do this is to climb to the eave door, look inside and smell for any signs of spoilage. Also, observe the roof for any frost or current or past signs of condensation. Turning on the fans during this time will assist in detecting musty odors associated with spoilage. If an observer is present it may also be useful to enter the bin and walk around on the top of the grain to determine if grain has started to spoil and clump together.