

Practicality Evaluation of Grain Storage Techniques

Investigator(s): Initiated by Dennis Gardisser (retired), Completed by Karl VanDevender, Extension Engineer

Crop(s): Corn\Grain Sorghum

Status: Completed for 3 funding years 2008-2010. Educational materials development and presentations based on this project continue.

Value to the Grower: The increase in corn acreage has mandated that much of the annual crop be handled, dried, and stored on farm. There are a large number of on farm bins that are utilized for this. Corn bags were utilized extensively in 2007-2009. However, limitations associated with bags point to the potential advantages of dryers and bins. General management procedures for on-farm handling, drying, and storing will help growers better manage their harvest options and capitalize on additional marketing alternatives. Collected bag, bin, and dryer data from cooperating Arkansas farms and sources from neighboring states were used to meet the objectives below.

Objectives:

1. Study several corn bag storage operations to determine best operating practices.
2. Study several on-farm bin operations, particularly larger size bins, to develop some comparisons.
3. Develop a broad base of educational material to familiarize producers with options and management guidelines.

Results:

1. For the storage of dry grain storage grain bags were demonstrated as feasible. Temperature measurements consistently dropped to ambient air temperatures over time. However, easily patched with tape, susceptibility to puncture and blocking field drainage in low lying areas appear to have reduced acceptance of grain bags for short term storage. Due to the lack of ventilation grain bags are not suitable for drying grain. Acceptable storage duration of ‘wet’ grain remains in question.
2. From project collected data grain drying cost, including energy and equipment, typically totaled \$0.25-\$0.80 per bushel. Due to the variability of input costs two calculators (cost calculator for corn drying and storage with a diesel powered fan bin system and cost calculator for corn drying and storage with a pass dryer bin system) were developed to enable individuals to estimate drying costs based on their inputs. These are posted at www.aragriculture.org/storage_drying/default.htm and can be accessed via the resources tab of www.corn-sorghum.org.
3. Given the importance of the grain’s equilibrium moisture content when making drying decisions and its dependence on current air humidity and temperature an equilibrium moisture content calculator was developed and posted at www.aragriculture.org/storage_drying/default.htm. It uses current grain and air conditions and the target moisture content to determine if the grain will tend to dry and if the target moisture content will be reached. It not the degrees of additional heat will be suggested,
4. An equilibrium moisture content table builder has been created and posted at www.aragriculture.org/storage_drying/default.htm. This tool is designed to print 8½ X 11 grain specific EMC tables for laminating and posting near bin fan controls.
5. The fact sheet “Suffocation Hazards in Grain Bins” has been revised and is available at www.uaex.edu/Other_Areas/publications/PDF/FSA-1010.pdf.

6. The publication “Grain Drying Concepts and Options” was completed and is available at the Division of Agriculture’s web site and county offices. This is the first of a series of grain drying fact sheets are being developed. Additional topics include, field drying, natural air/low temperature grain drying, high temperature grain drying, and dryeration/combination drying. These additional topics are in the final draft stage.
7. Over the 3 year life of this project grain drying/storage concepts and tips were presented at numerous producer meetings and field days. Most of these meetings included a formal presentation. A display table with a laptop demonstrating the software has also been utilized. Such events continue to be scheduled. In addition to providing the educational material via the traditional meetings and field days, a grain drying web page to provide access to the developed calculators was established at www.aragriculture.org/storage_drying. This page can be accessed by going to www.uaex.edu selecting Agriculture, Corn, then Grain Drying and Storage. Alternatively the Arkansas Corn and Grain Sorghum board web site (www.corn-sorghum.org) has a link on their Internet Resources Page.