Agricultural Engineering
Serves the Farmer
TRACTORS • MACHINERY • DRAINAGE • IRRIGATION • SOIL CONSERVATION
BUILDINGS • FARM ELECTRIFICATION • CROP DRYING AND PROCESSING

Purdue University
Cooperative Extension Service
Lafayette, Indiana 47907

Prairie Farmer Article
June 1969
George H. Foster
USDA Agricultural Engineer

IS DRYERATION FOR YOU?

Dryeration is a grain drying process consisting of a combination of heated air drying and aeration cooling. It works best with high speed, high temperature, batch and continuous dryers, and is applied mostly to corn. If you are a corn farmer using these types of drying systems, you should consider the merits of dryeration in your present and future planning.

Some of the first farmers using dryeration were those with drying equipment not quite large enough to keep up with their corn harvesting. With the increase in drying capacity possible with dryeration, they were able to "make do" with present dryers until they were more nearly worn out. Some of these people now have replaced their dryers with larger ones and no longer use dryeration. On the other hand, there are many farmers planning and installing new drying systems utilizing dryeration. In a recent meeting at Purdue University, some 20 to 30 percent of the large corn producers in attendance used dryeration.

Farmers and grain elevators interested in a quality corn market where reduced breakage is important are the most enthusiastic about the advantages of dryeration. Export corn, for example, is handled many times and the brittleness of the corn is important in the amount of breakage and fines produced. Most of the large export elevators now use dryeration exclusively.

The Dryeration Process

Let us look more closely at how the dryeration process works. The key to the successful use of the process is in the tempering period that follows heat drying and precedes cooling. The corn is heat dried and moved hot to a tempering bin where it remains four to eight hours before cooling is started. During the tempering period, stresses from the high speed drying are relieved and the moisture distribution within the kernel evens out. The corn is then cooled slowly with aeration. Stresses from rapid temperature changes are avoided, and the residual heat in the corn is fully utilized for maximum removal of moisture during the cooling phase. You can count on removing two percentage points of moisture during cooling if the corn goes into the tempering bin at temperatures between 130 and 140°F.

Many farmers use only one tempering bin. Hot corn from the dryer is accumulated during the day and cooled overnight. After unloading the following morning, the bin is again filled with hot corn. Other farmers use two cooling bins, billing and emptying each one on an alternate day basis. After the corn is cooled, it is moved out of the tempering bin either to market or to another bin for storage.

Problems with Dryeration

The problems with dryeration have been largely from moisture condensation during tempering and cooling. The hot corn steams or sweats, the vapor condenses on the roof and exposed bin walls, and drips on the corn surface. Spots of wet corn sometimes remain after cooling is completed. This has not caused any problem when the corn was moved out of the bin and the spots of wet corn were intimately mixed with the dry corn during the moving process. It is only when the corn is left in the same bin where it is tempered and cooled that spoilage resulted from the moisture condensation.

Research data show that the brittleness of the corn can be cut in half if the dryeration procedure is followed. Going to a separate and more efficient cooling operation often increases capacity 50 to 100 percent over than when the dryer is operated in the conventional manner. For more information on dryeration, write for AE-72, Dryeration -- Better Corn Quality with High Speed Drying, available from the Agricultural Publications, Agricultural Experiment Station, Purdue University, Lafayette, Indiana 47907

Cooperative Extension Work in Agriculture and Home Economics
State of Indiana, Purdue University
and the United States Department of Agriculture Cooperating
H. G. Diesslin, Director, Lafayette, Indiana
Issued in furtherance of the Acts of May 8 and June 30, 1914.