

Grain Drying System Saves Energy at McNall Farm

PARTNER NEWS UPDATE

To learn more about Focus on Energy,SM call 800.762.7077 or visit focusonenergy.com

Bill McNall is extremely happy with his new grain drying system. He recently installed a Shivers in-bin continuous flow drying system with computer controls that constantly monitor moisture levels. The Scharine Group installed the Shivers system. Both Shivers and the Scharine Group are Focus on Energy Program Allies.

“The automation is incredible,” he said. “The computer controls eliminate so much of the work I used to do. And, I’ve already noticed a big difference on my energy bills.”

Bill and Jacqueline McNall raise crops, including corn and beans, on their 3,500 acre family farm, called BJM Farms, near Janesville. The McNalls needed a new grain drying system for their corn crop and worked with Focus on Energy to identify and install one that is energy efficient. The McNalls grow 450,000 bushels of high quality food grade corn each year.

Bill McNall used to use a conventional drying system for his corn crop, but when he discovered the Shivers system at a farm show, he considered making a change. “I liked the automation aspect and saw the potential of the system. You can eliminate labor and touching the grain all the time.”

The Shivers system uses fans to draw warm air through the grain bin to reduce the corn’s moisture content. More importantly, the system’s computerized moisture sensing system maximizes energy efficiency by minimizing both electricity and natural gas use. This system will reduce the McNalls’ energy bills by over \$14,000 each year.

“The computer is the integral part of the Shivers system,” said Marlin Habecker, a Shivers

representative. “It takes as many as 120 samples of the grain’s moisture content per hour. And it operates the fan so it applies the right amount of heat to the corn. This ability to match the exact amount of heat needed, depending on the corn’s moisture content, is what makes the system so energy efficient.”

Prior to the 1960s, corn was usually picked by the ear and stored in open air cribs. Corn is typically harvested at about 25 percent moisture content and must be dried to about 15 percent moisture. Corn cribs allow corn to dry naturally, but they provide easy access to rodents and insects. The development of harvesters that could shell corn kernels from the cob at harvest time changed the drying process. Corn processed in this way is easier to move and store, but more difficult to air dry. As farm size and yield per acre continue to increase, farmers are investing in drying equipment to ensure their product is properly dried prior to storage.

Crop drying equipment gives farmers additional benefits. First, they can hold some or all of a crop in storage until bean or grain prices rise. This flexibility helps offset seasonal price fluctuations. Second, they can avoid paying “dockage fees” at a grain elevator for product that was not dried to safe storage levels. However, crop drying equipment does add significantly to a farm’s energy bills. These units generally operate using either natural gas or propane and employ fans that operate using electricity. So, it makes sense to install the most energy efficient unit available.

After Bill McNall harvests his corn, he deposits it in a grain bin. This bin has the Shivers drying unit attached to it. A fan draws warm air into the storage bin; a large natural gas-fired burner heats the air. The fan moves the warm air up through

the corn and dries it. A tapered sweep auger rotates around the bin and removes a dried layer of corn. A vertical auger transfers the dried grain to other storage bins. Then, the process repeats itself.

The system's computer controls manage the corn's moisture content; these controls match the temperature of the drying air to corn's moisture levels. Computerized controls offer more precise moisture and energy management capabilities.

"The difference is huge—my wife and I really noticed it this year," noted Bill McNall. "Early on, I couldn't believe the computer was really working, so I pulled out my old state-certified tester to double check, and voila! This technology is great."

"Our system offers farmers an energy efficient grain drying system that pays for itself very quickly," said Marlin Habecker.

In this case, the McNall's grain drying system will pay for itself in less than a year and a half. The project cost \$20,000 and is expected to yield \$14,758 in annual energy cost savings each year. It will reduce Bill McNall's natural gas use by 15,300 therms each year and his electricity consumption by 90,605 kWh each year. His utility, Alliant Energy, will benefit from the 80 kW reduction in annual electric demand. Bill McNall received an Implementation Grant from Focus on Energy to offset the costs of implementing this project.

Bill McNall worked with two Focus on Energy program allies on this project. Shivers, Inc. of Corydon, Iowa manufactured the grain drying system with computer controls. The company was the first in the industry to offer computer controlled systems in 1985. The Shivers system allows farmers to dry crops as fast as they are combined. The Scharine Group of Whitewater installed the Shivers system at the McNall's farm. Installation was completed in September of 2002.

"I hope other farmers take a look at this technology," said Bill McNall. "It eliminates so much work. I had to fire myself and give myself a new job on the farm!"