

DRIVING ENERGY SAVINGS



Crop production expenses are at the forefront of any farming operation, especially today with advanced crop genetics requiring a steady supply of nutrients and moisture to produce the maximum yields. One large operating expense is the energy required to operate irrigation pumping systems. A new technology is reaching up to 15 percent saving on energy usage - variable frequency drives (VFDs).

Glenn Schur, a local farmer out of Plainview, Texas, is one of the first in the area to experiment with VFDs for his irrigation pumping system. Schur graduated from Texas Tech University with an agriculture economics degree in 1980 and has been farming for 35 years.

Schur farms around 2,000 acres, including grass and production crops. Approximately 1,500 acres are in production crops most of which is irrigated by drip irrigation and center pivots.

Schur is a longtime member of the Texas Alliance of Water Conservation (TAWC), which strives to develop new methods and technologies that use less water and natural resources. Schur is also a member of the Texas Agriculture Lifetime Leadership Program (TALL) that promotes leaders that will be prepared to handle key issues related to agriculture.

"I enjoy being involved in anything that helps promote agriculture," Schur said. "We continuously need to look ahead to be better managers, be better agronomists and to be better farmers."

Schur is constantly looking for ways to conserve resources. One of the more recent conservation methods he has implemented is VFD to conserve energy.

"I started using VFDs after a young gentleman from the ginning side of agriculture shared with me that they were using slow start systems in the gin called Variable Frequency Drives," Schur said.

VFDs are an electronic drive system used to control electric motors. Its purpose is to vary motor speed by controlling input frequency and voltage allowing pump performance to be adjusted to match operating conditions.

"VFDs are motors that start slow then gradually speed up to their maximum speed," Schur said.

Standard electric motors have a start-up spike in their energy usage causing excessive energy costs. VFDs conserve electricity by eliminating the start up amplifier of standard motors resulting in lower electric costs.

Schur explains that a motor is placed in down-hole wells along with a water level monitoring device called a transducer module. A computer program communicates with the transducer to start the motor at a slow rate then adjust the speed up to the maximum speed until the preset depth is reached.

Traditional wells would pump the water level down below the pump causing it to suck air until it overheated and shut down the pump.

"Not only does it keep it from over pumping, we save the pump because air and sand are the worst things to have in an irrigation pump, causing wear and tear," Schur said.



Greg Sokora and Glenn Schur discussing the advantages of VFDs.



Photos provided by USDA-NRCS

Glenn Schur adjusting the settings on the VFDs.

Another advantage to VFDs is when water levels hit a low level mark. It will slow the motor down until the water stays at a constant level. Traditional motors would have to be squeezed down to regulate the water level, a technique that uses more electricity. Schur mentions that this was an unreliable method because you never really knew where the water level was.

“Utilizing VFDs maximizes water usage, saves costly pump repairs or replacements and it saves money on your electric bill,” Schur said.

“They save me about 10 to 15 percent on my electric cost.”

One drawback with VFDs that Schur pointed out is the initial cost of installation. Most of the time VFDs will cost in the range of \$7,500 to \$12,000 or more depending on horsepower. So it is something he says you have to weigh out, it is not something that will pay out in a year.

Schur also takes advantage of several programs offered through the Natural Resources Conservation Service (NRCS), a federal agency that works with landowners to conserve soil, water and other natural resources.

One of the NRCS programs Schur uses is the Environmental Quality Incentive Program (EQIP). EQIP provides financial and technical assistance to agricultural producers in order to address natural resource concerns on their land.

“EQIP helped us install lots of pivots and drip irrigation systems that conserve water and improved the efficiency in our farming operations, Schur said. “Even though we still use the resources I want to be remembered as using them wisely and we were able to pass it on to another generation.”

Because of farmers like Schur who are utilizing cutting edge technology and new experiments to find ways to cut input expenses. The NRCS in Texas has added VFDs to their payment schedule to help farmers with the cost of VFDs through the EQIP program. Greg Sokora, NRCS agriculture engineer for the High Plains and South Plains region says, to utilize the EQIP program through the NRCS program, you need to apply and meet the required guidelines.

“Farmers can go into any USDA Service Center and make an application for both financial and technical assistance for VFDs under the practice code for pumping plants through the EQIP program,” Sokora said.

Sokora spoke highly of the VFD systems and their ability to conserve energy and save farmers money on their irrigation pumping electric bill.

“By utilizing a VFD, irrigation farmers are able to match their electric-powered irrigation pumps to the irrigation well yield allowing them to manage their irrigation systems,” Sokora said.

VFDs are only the beginning of new computerized farming methods that are to come. Agriculture, according to Schur, is more than just farming. With today’s technology advances in farming practices, it is more and more important to be educated about how technology can enhance crop production. **T**



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