

JAMES LEWIS FARM

A Grain Farm Case Study

Mathias Ag Program

James Lewis operates a grain farm in Greensboro, Maryland, where he uses a diesel engine to pump water for his two center-pivot irrigation systems. He already modified the irrigation system to use low-pressure sprinkler nozzles to save energy, and was interested in installing a new electric pump to further reduce his energy costs. As an extension educator with the University of Maryland, Jim is always looking for ways to transfer his own experience to other farms. When he learned of an opportunity to quantify the energy savings from switching from a diesel- to electric-powered pump through the Kathleen A.P. Mathias Agriculture Energy Efficiency Program, he decided it was the right time to make this conversion. The program also provided a grant to help offset the cost of the project.

Jim spends nearly \$8,500 annually to run his diesel irrigation pump. The energy audit provided through the Mathias Agriculture Program identified the potential for an electric pump to reduce his energy costs by 87%.

Converting from diesel to electric power presents an opportunity for significant energy savings on irrigation pumping systems. Electric power plants are much more efficient than diesel power plants, and energy savings of over 50% are common for this conversion. Electric power plants also usually have fewer parts, so maintenance costs are often reduced as well.



As shown in Table 1, the energy savings from the pump replacement will pay for the project in 4.9 years.

Table 1: Implemented Efficiency Measures and Associated Savings

Recommended Measure	Diesel Savings (gal)	Electricity Savings (kWh) (increase)	Estimated Annual Energy Cost Savings	Installed Cost	Estimated Payback in Years
Pump Conversion Replace existing diesel irrigation pumping plant and pump with a 25 hp submersible electric motor and pump.	2,220	(11,283)	\$6,865	\$33,463	4.9

The pump was installed in April 2013, and Jim looks forward to seeing the savings add up this season. But the benefits go further. “The electric pumping units are less time consuming—I don’t have to worry about oil changes, engine repairs and fuel tanks,” said Jim. “Plus, the energy savings are significant and I’m really looking forward to putting the money I used to spend on diesel fuel towards something else on the farm.”