

# Propane-Powered Irrigation Engine Reduces Costs, Improves Efficiency For Florida Dairy Farmer

Established in 1987, Shenandoah Dairy is a large, family-owned farm and dairy operation in Live Oak, Fla. Shenandoah Dairy that milks approximately 3,300 cows a year and grows more than half of the cows' feed onsite in the form of corn, sorghum, oats, and ryegrass forages. The farm currently keeps 2,000 acres under irrigation year-round and harvests, stores, and feeds 45,000 tons of crops annually.

## PROBLEMS WITH TIER THREE DIESEL ENGINES DRIVE SWITCH TO PROPANE

Shenandoah Dairy recently upgraded the majority of its 23-pivot irrigation systems to tier three diesel engines or electric motors, complying with the Environmental Protection Agency's emission reduction standards for off-road diesel engines. However, performance issues and electronic problems on the engines have adversely impacted the farms' bottom line and emission goals.

"In the end, the tier three diesel engines are not burning cleaner," said Ted Henderson, Vice President of Shenandoah Dairy. "I spend more time driving out to check them to see if they're working, or driving around to get parts when they break, [so] I'm burning more fuel and producing more carbon emissions than before."

Complications with the diesel irrigation engines led Henderson to consider other low-emission engine options. He discussed his options with Todd Lawrence, general manager with the local farm supply outlet, Farmers Cooperative, and decided to buy a Ford 6.8-liter, propane-powered irrigation engine from Engine Distributors, Inc. (EDI).

"I thought it would be hard to make the conversion to propane, but they knew everything about what I was trying to do," Henderson said. "Propane already burns clean and meets all the specifications. There was nothing to do with it other than get it there and get it into place."

Henderson was also impressed with the engine's proficiency once it was installed.

"Each pivot is tied to our lagoon system through a pipeline," Henderson said. "So whichever power system is running the most efficiently, that's the system we run. The propane engine is now the most efficient. It just runs smoothly and everyone likes to run that engine."

## COMPANY

Shenandoah Dairy  
Live Oak, Fla.

## CHALLENGE & SOLUTION

When Shenandoah Dairy purchased tier three-compliant diesel engines for irrigation, the Florida farm also added a propane engine, reducing its operating costs and outperforming similar diesel models.

## RESULT

- Lower initial cost with propane compared with tier three-compliant diesel engines.
- Estimated \$10 an hour savings in fuel costs.
- Clean-burning propane cut oil changes in half compared with diesel.
- Increased convenience with automatic fuel delivery.



## REDUCED FUEL AND OPERATING COSTS WITH PROPANE

From the outset, the propane irrigation engine cost \$6,000 less than the same Tier 3-compliant diesel model, including tax, title, and tag. Through the Propane Education & Research Council's Propane Farm Incentive Program, Shenandoah Dairy also received a \$2,500 incentive on its engine purchase in exchange for documenting performance data for a year.

Henderson estimates Shenandoah will save about \$10,000 a year by using propane compared with diesel. Based on the price the dairy pays for propane and the consumption rate of the new engine, the cost to operate on propane is around \$11 per hour. In comparison, a similar horsepower diesel engine, costs \$21 per hour to operate.

"In a typical year, these engines run anywhere from 1,000 to 1,500 hours, and in drier years up to 3,000 (hours) a year," Henderson said. "So a difference in fuel costs of about \$10 an hour, like we've seen with propane, becomes a big deal. I can almost pay for the engine with the savings in fuel costs."

Shenandoah also has seen fewer oil changes on the propane engines compared with diesel models.

"Our diesel unit requires twice as many oil changes as our propane irrigation engine. [So propane] saves us half the money," Henderson said.

## AUTOMATIC REFUELING SYSTEM, LOCAL PROPANE DEALER ADD CONVENIENCE

Farmers Cooperative's satellite monitoring system automatically notifies Lawrence when the fuel in Shenandoah's on-site 1,000-gallon propane tank gets low, and he dispatches an employee to refill the tank.

"I tell our customers it's one less thing they have to worry about," Lawrence said. "They don't have to check their fuel or make sure they don't run out. We do that for them."

Reduced fuel and operating costs, along with the automatic refueling, has led Henderson to replace two more of his diesel irrigation engines with propane engines.

"We've already had discussions with Farmers Cooperative and EDI about taking more of the diesel units out and putting more propane engines in," Henderson said. "With propane, running the irrigation system is just cheaper."



**"I can almost pay for the engine with the savings in fuel costs."**

**TED HENDERSON**

Vice President, Shenandoah Dairy

## FOR MORE INFORMATION

To learn more about propane irrigation engines and the operations that use them, visit [Propane.com](https://www.propane.com).

THE PROPANE EDUCATION & RESEARCH COUNCIL was authorized by the U.S. Congress with the passage of Public Law 104-284, the Propane Education and Research Act (PERA), signed into law on October 11, 1996. The mission of the Propane Education & Research Council is to promote the safe, efficient use of odorized propane gas as a preferred energy source.

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