

Solar-Powered Pump Combats Livestock Watering Issues

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Solar panels that provide energy to pump water for their livestock watering system are allowing cattleman Dick Lester, owner of Spring Valley Ranch in Cherokee County, and operators Britt and Mark Carlson to better utilize their pasture, save money, reduce streambank erosion, and improve cattle performance on the remote 650-acre pasture.

Lester is one of several northwest Iowa livestock producers to implement the solar-powered watering system in recent years. Lester's system was planned, installed and cost-shared through Iowa Lakes Resource Conservation and Development (RC&D), based in Spencer. Jeff Kestel, Iowa Lakes RC&D coordinator, called Lester's livestock watering needs a "worst-case scenario" in terms of the distance and elevation water needed to be pumped.

When Lester purchased his Cherokee County property a few years ago, he felt he needed better utilization of the hilly pasture, and a better water source than the creek running through the pasture. His solar-powered system includes three watering tanks, each elevated and away from the creek.



Lester's new watering system was completed early in 2008, and cattle grazed the pasture with positive results. "The placement of the watering tanks allowed better forage utilization," he said. "If you go up the hills now, you can see the cattle used the whole pasture." The Carlsons say their 300-head of cattle of purebred Angus cattle are no longer all together, but spread out near the water tanks, which they like.

Erosion control and water quality benefits can also be attributed to the solar pumping system. For example, streambanks along Lester's creek are healing with signs of reduced erosion and vegetative growth, which means cleaner water with less sediment buildup. "Livestock stay away from the creek now, which cuts down on streambank erosion," says Brian Peterson, state grassland specialist with [USDA's Natural Resources Conservation Service \(NRCS\)](#). "The banks are no longer bare, and that's because cattle have access to other water."

Lester says it's amazing how quickly grass returned to the streambanks since installing the new solar watering system. "Anybody can see that it's way better for the land," he said.

The solar-powered watering system provides cost and energy savings, too. Lester saved money on installation, choosing not to run electricity to his remote pasture site for pumping power. The rural electric cooperative (REC) that services northern Cherokee County estimates it would cost Lester about \$4.75 per foot, or more than \$20,000, to run electricity to his water pump. "I like the idea of solar power and not depending on electricity from the grid to run it," he said. "The pasture is a good mile off the road. That is a long way to run electricity."

Lester says the solar-powered system will save him money in the long-run, too. "Once you've installed the system, that's the end of it," he said. With an electric pump, Lester would pay about \$30 in basic monthly fees, not including the cost to run the pump.

Another benefit of the solar-powered system is livestock health. Peterson says cattle stay in good condition when they have access to clean, reliable water.

How does the solar powered system work?

Kestel says Lester's new watering system is extraordinary in size and scope. Water is delivered from the creek through a pea gravel trench, buried 15 feet underground, to a helical rotary pump. Eight 175-watt solar panels power the pump that sends water through 4,600 feet of pipe to three watering tanks, reaching elevations of 150 feet above the pump.

Dewey Stouffer, of [Little Sioux Prairie Company](#), installed Lester's solar powered livestock watering system. He says water levels in the tanks signal the pump to add water. "When there is demand for water, a valve opens, and the pressure tank supplies water until the pressure is gone," he said. "Then it pumps nine gallons of water per minute up the hill until the tank shuts off. The system will pressurize again and shut off."



Stouffer says the size of pump and number of solar panels you need depends on the number of cattle, water source, amount of lift and how far water needs to be pumped. He said no batteries are involved. "We're storing water in the big water tanks rather than storing electricity in batteries," he said.

Solar-powered systems, like Lester's, rely on sunlight to generate power to the pump, but Kestel says cattle generally don't drink as much water when it's cloudy or rainy anyway. "The tanks are big enough that cattle have reserve water for nights and cloudy days," he said. Even on summer days with full cloud cover, Kestel says the pump will operate, but at a reduced rate.



How much does the system cost?

Kestel estimates most solar pumping livestock watering systems will cost \$5,000-\$7,000, depending on the type of pump, number of water tanks, feet of pipe, number of solar panels and the hours of labor needed for hire.

The life expectancy of the system is about 20 years. Stouffer recommends keeping the solar panels clean for optimum performance. It is also critical that the solar panels and pump are grounded properly.

For more information about solar powered livestock watering systems or to see a demonstration on how the system works, visit your [local NRCS field office](#).

RC&D Projects Helped Natural Resources, Economic Development

Jeff Kestel, Iowa Lakes Resource Conservation and Development (RC&D) coordinator, helped guide several livestock producers in northwest Iowa through their solar-powered livestock watering system funding, setup and installation. Iowa Lakes RC&D partnered



with Iowa NRCS to provide 75 percent cost-share to pay for the projects through Conservation Technical Assistance (CTA) funds.

Iowa Lakes RC&D is one of 17 councils in Iowa and 375 councils nationally that works to create jobs, protect the environment and improve the quality of life in rural communities. Kestel said the solar pumping livestock watering project is a perfect example of a good RC&D project. "It involves seeking out funds, working with several producers on natural resource-based projects and cooperating with NRCS offices and soil and water conservation districts," he said. "It is a business development project for Dewey (Stouffer), who is now a local contractor for solar equipment. The solar pumping project has benefited both natural resources and economic development for our area."

To learn more about RC&Ds and to locate an office near you, visit www.ia.nrcs.usda.gov/partnerships/rcandd.html.

Solar Pumps Eligible Through EQIP

Materials, equipment and installation for solar-powered livestock watering systems are eligible for financial and technical assistance through the 2009 Environmental Quality Incentives Program (EQIP). EQIP is a voluntary conservation program that promotes agricultural production and environmental quality. Visit your local NRCS field office for additional information.

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