Innovative Solutions to Problems

by Julie A. Best, Public Affair Specialist, USDA-NRCS, Auburn, AL

The old adage, "Necessity is the Mother of Invention," certainly holds true on the Hooper Farm in Winston County, Alabama. The Hoopers have a cow/calf operation. There is a nice pond on the farm, but the cattle were eroding the banks and stirring up the mud. To improve the water quality, the landowners wanted to fence the cattle out of the pond, but they still needed a permanent place for the cattle to get water. There was no location below the pond to install a water trough and there was no electricity near the pasture. So, it was time for innovative action.

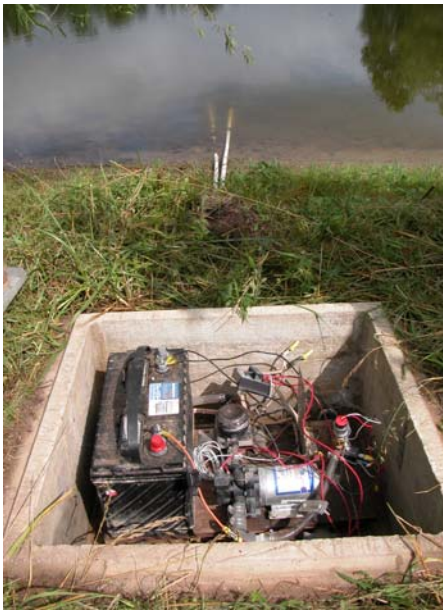
The construction of the ten-sided water trough is similar to that of a barrel. Steel cables hold the panels together.

After careful research, the Hoopers decided to face the challenge head on. Rather than purchase a trough, the Hoopers chose to build their own, and, since electricity was not available, they would use solar energy to pump the water.

The troughs are constructed from hand-poured concrete panels. The precast sections were put on a concrete slab and joined together with steel cables, similar to a barrel. The seams were caulked and finished with recycled metal that was once the water troughs for chickens. When fit together, the ten-sided trough holds nearly 500 gallons of water.

The solar panel is situated in a southerly direction to make best use of the sun's rays.

The trough is fitted with a pipe that allows the water to be pumped into the tank. An overflow pipe is also installed to return any excess water to the pond. A float in the tank controls the water flow. When the water level gets low, the float triggers the pump and fresh water is pumped into the trough.



Power is stored in a battery, which is connected to a small 12-volt pump. This system draws the water from the pond and pumps it up the hill to the trough.

According to Roy Hooper, "It was a slow process to get the solar system up and going." At first they tried something very simple—just a solar panel directly connected with a pump, but that didn't work. The pump kept burning out. The process kept gradually getting more complicated. Hooper found that he could use a battery to store the power. The battery is a marine battery that is designed to charge/discharge. The stored power operates a small 12-volt pump that draws water from the pond and pumps it up the hill to the water trough. A small filter on the intake pipe, which goes about 15 feet into the pond, protects the pump from debris. "The float in the tank triggers a switch. When the water level goes down, then the pump automatically comes on and replenishes the tank."

A float is used to trigger the pump when the water level gets low.

The solar panel is oriented in a southerly direction to catch the rays of the sun and get the best use of the power. The angle can be adjusted. Roy and his father did the research to determine how to set up and install the solar panel.

According to Roy, "The cattle like the system; several cows can drink at one time from the trough. The float is far enough away from the edge of the tank so the cattle can't bother it." The Hoopers have built two troughs. "We learned on the first one," says Roy, "and made adjustments on the second one. For instance, the first system was originally on a timer. That wasn't very successful, so we came up with the idea of the float to control the water level."

USDA-Natural Resources Conservation Service (NRCS) worked with the Hoopers to accomplish their conservation goals. According to Rusty Bull, Soil Conservation Technician with NRCS, "The landowners have used the Environmental Quality Incentives Program (EQIP) to do cross fencing and to fence all perennial water from free livestock access. The troughs and the fencing allowed the landowners to take one large pasture and make two pastures to better manage the available grass." And, while they were doing that, they improved their water quality. The Hoopers did not look at difficult conditions as a detriment—they saw it as an opportunity to use their creative skills.

Fencing the cattle from the pond has improved the water quality as well as created an aesthetically appealing pond.

For assistance with conservation challenges, contact your local USDA-Natural Resources Conservation Service office.