

Energy Efficiency and Farm Water Systems

Farm water systems are often neglected when it comes to energy efficiency. Although the savings to be realized may not be as great as perhaps energy-efficient lighting, the return can be fairly short for some energy-saving investments. Here are some general guidelines regarding farm water systems:

- Check all water system components regularly for proper operation and leaks. Leaks can lead to excessive pumping and water heating costs.
- Inspect wiring regularly.
- Use pipes of adequate size to reduce friction loss in pumping water.

Pump houses

Pump houses need to be designed to keep water systems from freezing. Several pump houses evaluated in the MAESTRO program had considerable air leakage and were not adequately insulated. The average cost of improvements to the pump houses was estimated at \$448 per farm with an annual energy cost savings of \$267 per farm. Adding insulation and sealing air leaks in the pump houses represent the main costs, improvements with a 1.7-year payback.

Spray-foam insulation can be used to seal leaks and insulate many pump houses. With larger air leaks, it might be more cost-effective to seal them with caulk or foam insulation and use batt insulation to increase the R-values in walls and ceilings. Pump houses should have a minimum R-value of 20 in the walls and 30 in the ceiling.

Livestock water systems

Energy-efficiency investments in livestock waterers can be as simple as insulating the waterers or adjusting the thermostat. Here are some guidelines regarding energy efficiency for stock waterers:

- Seal and insulate waterers if possible.

- The thermostats should be set for between 32 and 34 degrees Fahrenheit to provide frost-free water.
- Waterers should be checked regularly to ensure proper operation without leaks.
- Wind barriers can help reduce the cost of heating waterers.
- Be sure to turn off heaters in waterers in warmer weather.
- Install new waterers inside buildings, when possible, to reduce the energy needed to keep them from freezing.
- Use a circulating type of waterer that uses a limited amount of energy.
- Energy-free waterers further reduce energy consumption. Take care in selecting energy-free waterers to ensure that adequate water will be supplied and that the number of livestock are matched to the type of waterer for it to operate correctly.

In the MAESTRO program, energy assessments were made for stock waterers for 57 farms. The average estimated installed cost was \$1,677 with an estimated average energy savings of \$278, giving these investments an average payback of six years. Payback ranged from 0.1 to 76 years, so the estimated payback from energy-efficient investments can vary considerably from farm to farm.

Solar water systems

In some cases, solar pumping systems might be feasible for farm water systems. Solar pumping is most feasible when a system is needed in a remote location and the cost of running electric lines would be expensive. To be sure water will be supplied during cloudy weather, install batteries with the solar system to carry through those cloudy days.

Water heaters

Understanding the proper use and maintenance of water heaters will help you ensure that they run efficiently. It is also important to properly insulate water heaters. Keep these general guidelines in mind with regard to water heaters:

- The temperature of the water should be set depending on how it will be used.
- If you have an older water heater, you might benefit from installing an insulating blanket around the water heater. Insulating blankets can be purchased at many hardware stores, or you can make your own

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by wrapping insulation around the water heater. However, be careful not to block the air inlet for gas water heaters. Investments in water heater blankets can often result in a payback of a year or less.

- Insulate exposed hot-water pipes.
- Wash clothes in cold water when appropriate.
- Repair leaky faucets, especially those for hot-water.
- Install low-flow shower heads.

Additional information

You can find more information on solar pumping systems in MU Extension publication EQ380, Pumps and Watering Systems for Managed Beef Grazing, at <http://extension.missouri.edu/p/EQ380> and National Sustainable Agriculture Information Service publication, Solar Powered Livestock Watering Systems, <https://attra.ncat.org/attra-pub/summaries/summary.php?pub=250>.

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