



OVERVIEW

Steps in the Irrigation Series

1. Understanding Irrigation Efficiency
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E³A: Irrigation Efficiency

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Should I Be Concerned About Irrigation Efficiency?

Water is heavy and moving it any direction, except downhill, takes substantial energy inputs. Irrigation is a leading use of energy on many agricultural operations in the central and western United States. This Exploring Energy Efficiency and Alternatives (E3A) series focuses on reducing energy consumption through conservation (behavior changes) and efficiency (improved technology).

The series is designed to help natural resource and agricultural professionals assist irrigators in reducing energy consumption and improving profitability. The module also seeks to reduce risk by limiting agricultural producer exposure to energy price increases and water supply curtailments.

This series of publications addresses different perspectives for introducing and evaluating various irrigation efficiency terms, how these aspects are interrelated, and suggestions to consider when designing and improving an irrigation system. The series will primarily focus on energy and water efficiency under center pivot irrigation.

There are several critical questions that help determine your suitability to explore energy efficiency related to irrigation efficiency.

Are your irrigation systems gravity fed (e.g., no pumps or motors)?

If already using hydropower (water flowing downhill) to deliver water to fields, with no purchased energy (e.g., electricity, diesel, propane), then this module is not for you. If you reduce excessive head through pressure-reducing valves or other techniques, then explore the E3A micro-hydropower for home, farm, and ranch series.

Are your systems in need of updates, regardless of energy consumption?

Energy and water efficiency improvements can be cost-effective regardless of the system's age, but equipment at the end of its functional life presents a uniquely cost-effective opportunity.

Are you facing reduced water availability?

More effectively applying water to fields can result in less energy needed for irrigation (e.g., less water delivered means fewer energy inputs). If reducing water use has a financial value, it can drive improvements that would not be cost-effective solely on the basis of energy savings.



Canola field under pivot irrigation.

Ron Nichols, Washington, <https://photocontest.usda.gov/entry/seasonalphotocontest?catalog&template=detail.mkt&id=itemid&op=matches&value=7319188&site=PhotoGallery>

E3A: Irrigation Efficiency is a peer-reviewed publication series.

Original available at: www.wyoextension.org/publications/

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The differences in the price of fuel sources, such as electricity, diesel, gasoline, propane, natural gas, or ethanol, impacts the feasibility of energy enhancements. Higher-cost energy means more energy efficiency improvements will be profitable. Carefully consider the cost of service, particularly demand charges when evaluating the benefits of improvements.

Various state, federal, and utility-sponsored programs are available to producers seeking to reduce energy and water inputs. Improvements are more likely to be cost-effective if you are willing to utilize these programs.

The irrigation efficiency module is well worth your time and attention if these critical questions indicate you should proceed. Please remember your local Cooperative Extension office can likely provide further information if you have additional questions beyond the scope of this module.

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