



** This news release from K-State Research and Extension is available online at <https://ksre-learn.com/maximizing-irrigation-efficiency>

Note to editors: A photo to accompany this story is at <https://www.flickr.com/photos/ksrecomm/54363436174>

Released: March 4, 2025

Maximizing Irrigation Efficiency: Key Steps for Farmers in 2025

Simple system adjustments can improve water use, reduce costs and increase yields

By Kelsey Stremel, K-State Research and Extension news

HAYS, Kan. – With declining Ogallala Aquifer levels and rising input costs, efficient irrigation is more critical than ever for Kansas farmers. Since 1989, irrigated acres in western Kansas have dropped by nearly 11%, making water efficiency a growing priority for producers. Experts say optimizing irrigation systems can cut water waste by up to 25% while maintaining or improving crop yields.

Jonathan Aguilar, K-State Research and Extension water resource engineer, estimates that based on numbers from recent field evaluations, more than 50% of irrigation systems in Kansas are not operating at peak efficiency, leading to yield losses and excessive water use. Common issues include worn-out pressure regulators, uneven water distribution, and outdated scheduling methods.

“Many farmers assume their systems are working as designed, but testing often reveals pressure drops, clogged or missing nozzles, and regulator failures that reduce performance,” Aguilar said. “A well-maintained system can significantly improve water use efficiency while ensuring crops get the moisture they need at the right time.”

Center pivot irrigation systems represent a significant financial investment for producers. Each pivot system is engineered for a specific field, but small changes and wear over time can lead to subpar performance and higher water costs.

Aguilar said one of the most common issues is low operating pressure, which results in uneven application depths — especially in fields with elevation changes. Poor water distribution can reduce yields by up to 15% in water-sensitive crops like corn and soybeans.

Before planting, farmers should evaluate their system’s performance by comparing actual flow rates and pressure readings to the original sprinkler package design. Even a 10 PSI pressure

drop can reduce water application uniformity by 30%, leading to uneven coverage and possible reduced yields. Checking system pressure at the pivot point and the last nozzle can help identify these issues before they affect productivity, according to Aguilar.

Regular equipment inspection is also essential. Pressure regulators should be replaced every 5-10 years to maintain consistent performance. Poor regulation can result in under-watering by as much as 20% in some field areas. Farmers should also inspect nozzles for misalignment or blockages, which can create dry spots and uneven crop growth.

Effective irrigation scheduling can also save water and reduce costs. Many producers still rely on fixed schedules rather than real-time soil conditions, leading to overwatering.

Using soil moisture sensors and weather-based scheduling tools can reduce irrigation by 15-20% while maintaining yields, "particularly if we can use these tools to maximize rain events," Aguilar said.

Farmers should also consider adjusting pivot speed to apply between 0.8 and 1.2 inches per pass, improving infiltration and reducing water waste.

Because irrigation systems consist of interconnected components, Aguilar said adjusting one part may require recalibrating others to maintain efficiency. Conducting a distribution uniformity test by placing measuring cups along the pivot's path can help detect variations in water application. Adjusting flow and pressure settings accordingly can prevent unnecessary water loss and ensure consistent crop performance.

With Kansas losing irrigated acreage due to declining water availability, efficiency is no longer optional; Aguilar says it is necessary for long-term profitability and sustainability.

"Even a 5% improvement in irrigation efficiency can translate into thousands of gallons of water saved per pivot each season," Aguilar said. "Farmers who optimize their irrigation systems will be better positioned to handle future water constraints and maintain yields."

Farmers seeking technical assistance can contact the USDA's Natural Resources Conservation Service (NRCS) for help connecting with certified technical service providers. K-State Research and Extension irrigation specialists are available to help assess system performance and recommend improvements.

Learn more about irrigation management strategies online with [K-State's Mobile Irrigation Lab](#), or contact your [local K-State Research and Extension office](#).

-30-

FOR PRINT PUBLICATIONS: Links used in this story
Mobile Irrigation Lab, <https://www.milab.ksu.edu>

K-State Research and Extension statewide offices, <https://www.ksre.k-state.edu/about/statewide-locations>

K-State Research and Extension is a short name for the Kansas State University Agricultural Experiment Station and Cooperative Extension Service, a program designed to generate and distribute useful knowledge for the wellbeing of

Kansans. Supported by county, state, federal and private funds, the program has county extension offices, experiment fields, area extension offices and regional research centers statewide. Its headquarters is on the K-State campus in Manhattan. For more information, visit www.ksre.ksu.edu. K-State Research and Extension is an equal opportunity provider and employer.

Story by:

Kelsey Stremel
stremelk@ksu.edu

For more information:

Jonathan Aguilar
jaguilar@ksu.edu