Integrated cattle grazing systems can conserve critical resources without impacting economic viability

In a new perspectives and commentary from Applied Animal Science researchers outline how one Kansas farm has used integrated grazing to conserve water and reduce fertilizer use, all while still supporting profitable beef production

Champaign, IL, April 1, 2024— A new study published in Applied Animal Science details how Thunderstruck Farms, a Kansas agricultural operation, has significantly reduced its water usage by converting irrigated cropland to an integrated cattle grazing system. This innovative approach demonstrates the potential for agricultural businesses to thrive while also conserving critical resources and boosting sustainability.

“Water conservation is crucial for long-term sustainability of agriculture in much of the western United States,” said David K. Beede, PhD, editor in chief of Applied Animal Science. “This article describes an example of conversion of cropped farmland to an integrated cattle grazing operation and the associated changes in farming practices and cattle needs, and the dramatic change in water use. Water intake of cattle in backgrounding and feedlot phases also were quantified. The grazing system provided the opportunity to produce economically viable beef while reducing overall water use and fertilizer inputs. The potential to extend groundwater supply, conserving water to sustain rural communities, is discussed.”

Thunderstruck Farms, located near Garden City, Kansas, began participating in a water conservation area program in 2018, to aid in extending the usable lifetime of the Ogallala Aquifer—which is currently the largest area of groundwater withdrawal in the United States. Part of this program involved transitioning to an integrated beef cattle grazing system.

Previously, Thunderstruck Farms would have used irrigated crop land for growing corn for grain, but now all crops grown are used for silage, hay, or pasture to support their local dairy and feedlot enterprises. Light-weight beef cattle grazed these irrigated pastures for approximately 120 days before entering the finishing phase.
By transitioning from growing corn for grain to raising cattle on irrigated pastures, the farm used 50.9 billion liters (13.4 billion gallons) less water than allocated, with 57.8% of the savings occurring during the five-year period of the water conservation area program. They were also able to reduce nitrogen fertilizer use by 39% per year and improve their soil fertility, all while still producing a viable amount of beef.

Caption: Integrated grazing systems hold promise for the future of agriculture in the Ogallala Aquifer region and beyond (Credit: Gina Gigot).

“Our research shows that integrated grazing systems can be a win-win for both beef producers and the environment,” said Miles E. Theurer, PhD, of Veterinary Research and Consulting Services LLC, Hays, Kansas, USA, and lead author of the study. “By reducing water use and fertilizer application, these systems can help to ensure the long-term sustainability of agriculture in the Ogallala Aquifer region, make more water available for the surrounding area, and allow for a thriving agriculture economy.”

The study also found that cattle grazing irrigated pastures consumed an average of 17.94 liters (4.74 gallons) of drinking water per head per day. These data are essential for understanding the total water footprint of integrated grazing systems.

The findings of this study offer valuable insights for agricultural producers seeking to reduce their environmental impact while maintaining economic viability. Integrated grazing systems hold promise for the future of agriculture in the Ogallala Aquifer region and beyond.

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Notes for editors

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To schedule an interview with the author(s), please contact Miles E. Theurer at miles@vrcsllc.com.

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