

Optimizing Land & Forage Use for Beef Production

THE CHALLENGE

The North Central region is home to 11 million beef cows, 35% of the nation's herd. Beef production is a vital part of the economies of these states; however, grassland conversion to cropland, widespread woody encroachment, and rising land prices have reduced the availability of land and forage for livestock. The number of cows in the region has steadily declined in recent decades despite stable demand for beef.

THE WORK

Researchers at land-grant universities across the North Central U.S. are working together to help beef producers make the most of land and forage resources now and into the future by:

- Identifying ways to increase the *productivity* of pasture and rangelands.
- Identifying *alternative* forage resources.
- Evaluating *integrated* crop-cattle systems.
- Optimizing cow-calf operations that use *limited* perennial pasture.

THE IMPACTS

This project's research and Extension has:

- Improved **forage production** and **resource use**.
- Enabled beef cattle producers in the North Central U.S. to **retain** or **expand herds**.
- Improved **profitability** and **resilience** of beef cattle producers in the North Central U.S.
- Helped **meet consumer demand** for **safe, affordable, high-quality beef**.
- Supported **healthy rangelands** that provide **ecosystem services** such as water filtration, carbon sequestration, and wildlife habitat.



RESEARCH HIGHLIGHTS

In recent years, project scientists have:

- Increased producer awareness of how healthy soils contribute to high-quality forage.
- Identified annual forages that can be interseeded into perennial pastures to increase forage. For example, establishing sorghum-sudangrass in cool-season western wheatgrass improved forage production nearly **3 tons per acre**.
- Identified optimal seeding and fertilizer rates to maximize forage growth and nutrient content.
- Gave producers a better understanding of situations in which manipulating grassland plant communities (for example, through herbicide applications) will—and will not—enhance livestock productivity and profitability.
- Informed weed management strategies.
- Showed how virtual fencing can be used to keep grazing cows in or out of specific areas, improving forage growth and helping disturbed areas recover. For example, when virtual fences were used to rotate grazing cows across different areas of a pasture every three to four days, forage yield increased **30%**.
- Evaluated the use of prescribed burns to improve pasture quality.
- Identified cost-effective alternative feedstuffs such as earlage, dried distillers grains, and abandoned, weed-infested wheat crops.
- Provided data on the right amounts and methods of feed supplementation and strategies like limit-feeding when forage or roughage resources are limited or unavailable.
- Showed planting corn and forage sorghum in the same field using a split-row planter reduced seed costs and did not impair crop performance. Using the sorghum to feed cattle in confinement reduced feed costs and increased profitability by **\$32 per animal**.
- Found strip grazing of cover crops planted in late summer can increase carrying capacity, gain per acre, and harvest efficiency—gains that outpace the added labor of planting cover crops.
- Demonstrated cattle grazing corn residues do not impair field soil health or subsequent corn yield. Growers can gain income by leasing corn acres to beef producers after harvest—gains worth an estimated **\$95 million** for the crop sector in Kansas, Nebraska, North Dakota, and South Dakota.
- Provided data on the nutrient composition of forages on Conservation Reserve Program lands, helping producers and policymakers understand the value of the program.

OUTREACH HIGHLIGHTS

In recent years, project members shared research findings with **2,795 producers** and other stakeholders across nearly 25 public events. In particular, project members led multiple workshops sharing how grazing crop residues and cover crops can lower feed costs. Beef producers valued this knowledge at an estimated **\$28 per cow** or about **one million dollars** across the surveyed producers.

Online webinars have received over **9,000 views**. Electronic newsletters and podcasts have over **50,000 subscribers** and additional downloads.

Project members collaborate with state and federal; agencies, industry associations, private companies, conservation districts, and other organizations to share research findings and recommendations.

THE MULTISTATE APPROACH

With federal capacity funding, this Hatch Multistate project brings together researchers from multiple states and disciplines. Led by collaborating land-grant institutions, this project is able to:

- **Share expertise** across disciplines, including animal science, crop science, and economics.
- **Represent** a variety of species, production types, and growing conditions.
- **Coordinate efficient** research that shares resources, spreads workload, and reduces redundancies.
- **Leverage** external competitive grants by demonstrating established teams and track records of productivity.
- **Integrate Extension** to share research with producers and scientists.

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MULTISTATE RESEARCH FUND
IMPACTS

