

# Animal Productivity when Grazing Biodiverse Native Pastures

**Summary:** Pollinator declines and growing interest in sustainable agricultural practices have increased interest in interseeding native wildflowers into native warm-season grass (NWSG) pastures. Although NWSG produce excellent gains for growing classes of cattle, the effects of interseeded native wildflowers have not been evaluated. Therefore, we compared forage and animal outcomes, and pasture productivity for NWSG pastures with and without an 18-species blend of interseeded wildflowers. Researchers measured forage mass, forage nutritive quality, and steer weights monthly for three summer grazing seasons. Total forage mass declined due to an increase in grazing days and weakened forage stands due to selective grazing. The wildflower-enhanced paddocks produced forage with stable, season-long crude protein and lower late-season fiber concentrations compared to native grasses alone. This forage quality supported higher season-long average daily gain and pasture productivity in wildflower-enhanced pastures.



Steers grazing a wildflower-enhanced pasture in June when black-eyed Susan was in bloom. Photo by: Jessica Prigge

## **Project Objectives:**

- Compare forage mass, forage quality, animal performance, and pasture productivity in NWSG pastures with and without interseeded wildflowers.
- Determine the impact that continuous, low-stocking density grazing has on weed mass and NWSG persistence for diverse NWSG pastures.

## **Methods:**

- A preexisting big bluestem/indiangrass/little bluestem pasture was divided into 3-ac paddocks, half of which were interseeded with an 18-species blend of native wildflowers.
- Weaned steers were continuously grazed in each paddock for the three summers. The first grazing season was limited to 90 days, but the following two seasons allowed steers to graze into September until stands became over-mature and began to move into fall dormancy, 120 – 135 days.
- Researchers measured forage mass, forage quality, and steer mass each month throughout each grazing season. Observations were noted about any grazing selectivity of the wildflowers.

## **Farmer Takeaways:**

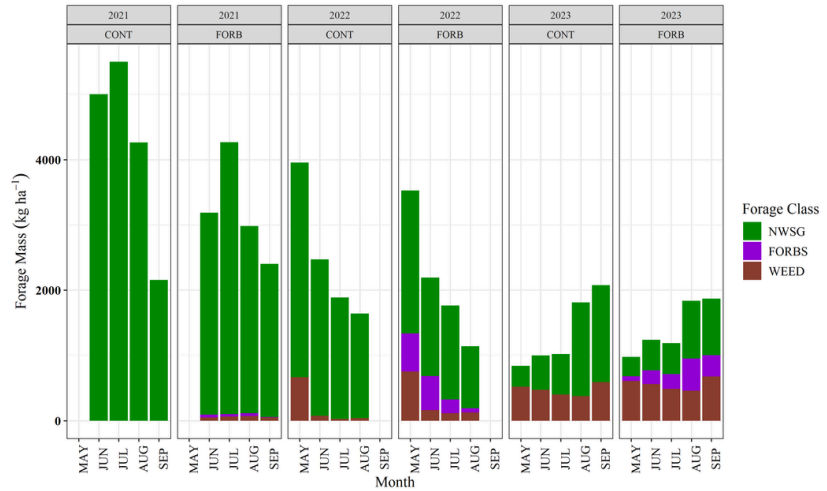
- Forbs provide nutrient-dense forage and can support grazing steers in mixed native pastures into early fall.
- Wildflower-enhanced pastures produced greater season-long average daily gains (ADGs) and total gain (GAIN) compared to NWSG-only pastures.
- Low stocking densities increased grazing selectivity. Used strategically, this tactic can allow wildflowers to fill in stand gaps and may improve steer gains.



Late season grazing in a wildflower-enhanced pasture. Maximilian sunflowers, a late flowering wildflower, line the background. Photo by: Jessica Prigge

## Results: Technical Findings

- Total forage mass declined each grazing season, and both wildflower and weed mass increased (Figure 1). Although the increase of weeds suggests weakened stands from low stocking density (more selective grazing weakening the NWSG), the decrease in forage mass was likely also due to longer grazing seasons and earlier grazing initiation (up to two weeks earlier) in years 2 and 3 compared to year 1.
- Wildflower-enhanced pastures provided stable crude protein throughout the season with lower fiber content compared to NWSG-only pastures. Maintaining high-protein and digestible forage later in the grazing season can help steers better transition to cool-season forage in the fall and maintain gains.
- Monthly ADGs were similar for steers grazing both pasture types (Figure 2). However, small differences in monthly ADG accumulated, leading to higher season-long ADG and GAIN for steers grazing wildflower-enhanced pastures (Table 1).



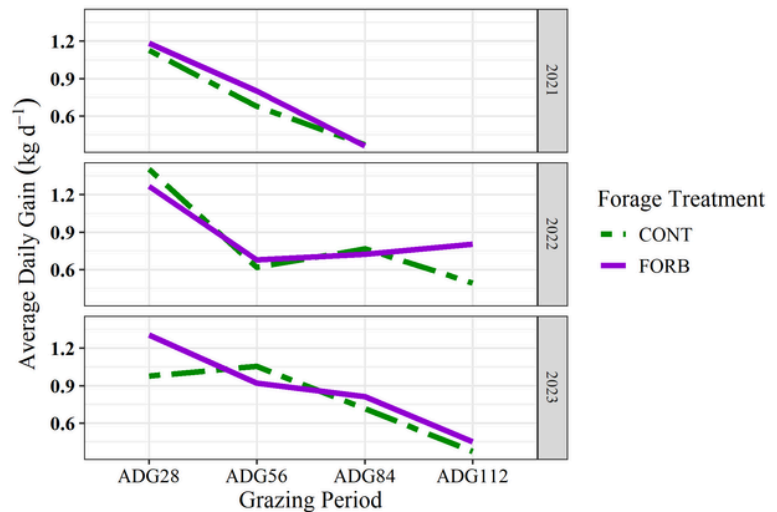
**Figure 1: Average forage mass by forage class within CONT<sup>\*</sup> and FORB pastures, 2021–2023, at the East Tennessee AgResearch and Education Center, Holston Unit, Knoxville, TN, USA.**

<sup>\*</sup>Control NWSG pasture, CONT; native warm-season grass, NWSG; wildflower-enhanced pasture, FORB; wildflower forage class, FORBS; mixed native warm-season grass forage class, NWSG; weeds forage class, WEED.

**Table 1: Mean ADG and pasture productivity of weaned calves grazing CONT<sup>\*</sup> and FORB pastures, 2021 – 2023, at the East Tennessee AgResearch and Education Center, Holston Unit, Knoxville, TN.**

Productivity measurement	Year	CONT	FORB
Season long ADG (kg/d)	2021	0.66	0.73
	2022	0.71	0.78
	2023	0.74	0.81
AD (d/ha)	2021	327	327
	2022	530	500
	2023	490	490
GAIN (kg/ha)	2021	170	190
	2022	295	316
	2023	291	312

<sup>\*</sup>Control NWSG pasture, CONT; native warm-season grass, NWSG; wildflower-enhanced pasture, FORB; average daily gain, ADG; animal days, AD; total bodyweight gain, GAIN.



**Figure 2: Average daily gain of weaned steers grazing CONT<sup>\*</sup> and FORB pastures by 28-day periods, 2021–2023, at the East Tennessee AgResearch and Education Center, Holston Unit, Knoxville, TN, USA.**

<sup>\*</sup>Control NWSG pasture, CONT; native warm-season grass, NWSG; wildflower-enhanced pasture, FORB; average daily gain, ADG; ADG first 28 days of grazing, ADG28; ADG second 28 days of grazing, ADG56; ADG third 28 days of grazing, ADG84; ADG fourth 28 days of grazing, ADG112.

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