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Evaluation of Warm-Season Annual Grasses for Southern Forage-Finished Beef Systems

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Objectives

In the southeastern United States, long growing seasons allow for near year-round forage production but high summer temperatures and drought can negatively impact forage production, nutritive value, and, consequently, performance of grazing animals. Warm-season annual grasses are typically higher in nutritive value than common warm-season perennial forages in the Southeast. Drought tolerant warm-season annuals may provide forage-finished beef producers with alternative options during the summer months. The objective of this research was to evaluate and compare drought tolerant warm-season annual grasses for beef forage-finishing systems in the Southeast across a 3-yr grazing trial in central Georgia (2014 to 2016).

Materials and Methods

Sixteen 0.81-ha paddocks were blocked by previous land management and randomly assigned to 1 of 4 forage treatments with 4 replications. Treatments included: 'Tifleaf 3' pearl millet (PM), 'Tifleaf 3' pearl millet plus 'Red River' crabgrass (PMCG), 'Sugar Grazer II' sorghum sudangrass (SS), and 'Surpass' brown mid-rib sorghum sudangrass (BMR) which were planted in mid to late spring of each year. Each year 32 previously stockered Angus crossbred steers (434 ± 19 kg) were stratified by weight, paired, and randomly assigned to treatment paddocks. Paddocks were split into 2 sub-paddocks for rotational grazing. Additional steers and heifers were used as "put-and-take" animals to maintain forages in a vegetative stage. All treatment steers were weighed after an 8-h fast at the beginning, mid-point, and end of the grazing period and average daily gain (ADG) and total body weight gain (BWG) were calculated. Steers were slaughtered under USDA inspection in September of 2014, 2015, and 2016 after 70, 63, and 56 d on treatment, respectively. Carcass quality and yield data were collected 24-h post-mortem and boneless strip loin (longissimus lumborum) sub-primals were removed from the right side of each carcass, vacuum packaged, boxed, and allowed to age (0 ± 2°C) for 21 d. After aging, steaks (2.54-cm) were fabricated from each strip loin starting at the anterior end and allocated to proximate analysis, Warner-Bratzler shear force (WBSF), and trained sensory analysis. Data were analyzed using PROC GLIMMIX (SAS v9.4; SAS Inst. Inc., Cary, NC). Pasture served as the experimental unit with steer as the observational unit. Year was included as a fixed effect, while block and pasture were included as random effects. Means were separated using the PDIFF option of LSMEANS at $\alpha \leq 0.05$.

Results

No differences ($P > 0.05$) were observed among treatments for ADG, BWG, dressing percent, subjective lean and fat color, fat L*, a*, and b*, lean L*, marbling, lean and skeletal maturity, fat thickness, adjusted fat thickness, kidney pelvic and heart (KPH) fat, yield grade, percent lipid, protein, and moisture, WBSF, beef flavor intensity, or off-flavor intensity. Treatment effects ($P < 0.05$) were observed for lean a*, lean b*, ribeye area (REA), percent ash, and juiciness, however, these differences were small in magnitude. Differences ($P < 0.05$) in initial and sustained tenderness were observed among treatments in 2014 only. Differences were observed across years for most variables, which were attributed to variability in weather conditions for the given year.

Conclusion

This data shows that PM, PMCG, SS, and BMR are viable warm-season annual options for beef forage-finishing systems in the southeastern United States.

