Growth Performance of Heifers Grazing Wheat and Ryegrass Pastures Sod-Seeded with Different Tillage Intensities and Seeding Dates

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Story in Brief

A total of 80 Gelbvieh x Angus crossbred heifers (556 ± 3.9 lb initial BW) grazed one of eight 5-acre pastures of common bermudagrass overseeded with wheat and ryegrass during the winters of 2002 and 2003 to compare the effect of seeding dates and tillage intensities on heifer growth performance. One half of the pastures were seeded during the first week of September (EARLY) and half were seeded in mid-October (LATE). Within each seeding date, half of the pastures were disked once (1x) and the other half were disked twice (2x) before seeding. Grazing began December 20, 2001 on each pasture for year 1, and began November 20, 2002 on all EARLY pastures and December 5, 2002 for all LATE pastures in year 2. Grazing continued through May 11, 2002 in year 1 and through April 25, 2003 in year 2. Initial forage mass was greater ($P < 0.05$) and average forage mass tended ($P < 0.10$) to be greater from EARLY than from LATE seeded pasture. Body weights and gain did not differ ($P > 0.10$) between seeding dates or tillage intensity. Based on 2 years of grazing animal performance data, producers may have considerable flexibility in their decisions as to when to seed annual forages and to what level they till their sod.

Introduction

Sod-seeded winter annual forages provide a high-quality feed source for wintering weaned calves. In a previous 3-year study at the University of Arkansas Southeast Research and Extension Center, weaned calves gained approximately 2 lb/day between mid-December and mid-April while grazing sod-seeded winter annuals (Coffey et al., 2002). The major disadvantages of the sod-seeded winter annual program were the year-to-year variability and the inability to begin grazing prior to mid-December. This means producers must find other forage alternatives to winter annuals between the time of weaning and initiation of grazing in mid- to late December. Our objective in this study was to evaluate earlier seeding dates of winter annuals and more intensive tillage of the bermudagrass sod to determine if those practices would promote more fall forage growth, allowing for earlier grazing or greater animal gains.

Experimental Procedures

A total of 80 Gelbvieh x Angus crossbred heifers (556 ± 3.9 lb initial BW) grazed one of eight 5-acre pastures of common bermudagrass during the winters of 2002 and 2003 that were previously overseeded with winter annual forages. All pastures were seeded with 30 lb/acre of 'Marshall' annual ryegrass plus 120 lb/acre of 'Madison' soft wheat. One half of the pastures were broadcast seeded during the first week of September (EARLY) and half were broadcast seeded in mid-October (LATE). Within each seeding date, half of the pastures were disked once (1x) and the other half were disked twice (2x) prior to seeding. The eight pastures were divided into two blocks of four pastures and the pastures were allocated randomly within block to one of the four treatment combinations. Pastures were fertilized with a complete fertilizer mixture to provide 50 lb/acre each of N, P_2O_5, and K_2O (as potassium chloride) during the fall and with an additional 50 lb/acre of N in the spring.

Within each year, heifers were stratified by weight and allocated in a random stratified manner to each pasture. Grazing began December 20, 2001 on all pastures and continued until May 11, 2002 in year 1. During year 2, grazing began November 20, 2002 on EARLY pastures and on December 5, 2002 on LATE pastures and continued until April 25, 2003. At that time, heifers were co-mingled to facilitate breeding. Weights were measured monthly without prior removal from pasture and water. Heifers were offered 2 lb/day of a grain sorghum-based supplement that contained trace mineralized salt and 150 mg Rumensin®.

Available forage mass was determined monthly during the study using a calibrated disk meter. Data were analyzed as a 2 x 2 factorial arrangement of a repeated measures experiment using the GLM procedure of SAS (SAS Inst., Inc., Cary, NC).

Results and Discussion

No seeding date by tillage intensity interactions or year by treatment interactions were detected ($P > 0.05$) for any of the measurements in this study. Therefore, data were combined across years. Available forage mass at the time grazing was initiated was almost 1,000 lb/acre higher ($P < 0.05$) from EARLY than from LATE (Table 1). Average forage mass tended ($P < 0.10$) to be greater from EARLY than from LATE. However, based on visual appraisal, a considerable portion of this forage mass was residual bermudagrass that grew after cattle removal and seeding of the EARLY forages. This will likely be validated when pending forage quality analyses are completed. Available forage mass did not differ ($P > 0.10$) between seeding dates or tillage intensity at the end of the grazing period.

No significant differences were detected ($P > 0.10$) among tillage intensity and seeding date combinations for heifer gains or daily gains (Table 2). Overall, heifer gains were good and averaged 2.14 lb/d across treatment combinations. Numerically, trends were for total heifer gains to be greatest from EARLY seeded pastures disked moderately and lowest from heifers grazing EARLY seeded pastures disked lightly. Numerical trends were for daily gains to be greatest numerically from heifers grazing LATE seeded pasture disked moderately.

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The EARLY seeding date allowed the winter annual forages time to produce greater quantities of forage earlier in the fall in year 2. This allowed heifers to begin grazing 15 d earlier on EARLY pastures in year 2. This earlier grazing initiation did not, however, increase total gain, but did increase the average number of grazing d/acre. Failure for improvements in total gain is likely because of the large amount of dormant bermudagrass contamination in the EARLY pastures.

Implications

Sod-seeded winter annuals continue to be a viable feed source for developing heifers during most years. Because of a high degree of variability in fall weather patterns, it might be advantageous for producers to split acreage and seed some of the acreage early and some later in the fall to hedge against this variability in weather patterns.

Literature Cited

Coffey, K.P., et al. 2002. J. Anim. Sci. 80:926.

Table 1. Winter annual forage mass (lb/acre) of sod-seeded winter annuals planted in early September (EARLY) or mid-October (LATE) after light (one) or moderate (two) diskings – 2-yr average.

	Light disking		Moderate disking		
	EARLY	LATE	EARLY	LATE	SE
Initial mass, lb/acre[ab]	2,455	1,301	2,300	1,490	179.7
Final mass, lb/acre	1,662	1,926	2,152	1,658	471.2
Average mass, lb/acre[c]	1,653	1,252	1,740	1,272	162.5

[a] Grazing began on December 18, 2001 in year 1, on November 20, 2002 for early seeded pastures and December 5, 2002 for late seeded pastures in year 2.

[b] Differences were detected between seeding dates ($P < 0.05$).

[c] Differences were detected between seeding dates ($P < 0.10$).

Table 2. Growth performance by heifers grazing sod-seeded winter annuals planted in early September (EARLY) or mid-October (LATE) after light (one) or moderate (two) diskings – 2-yr average[a].

	Light disking		Moderate disking		
	EARLY	LATE	EARLY	LATE	SE
Initial weight, lb[b]	557	560	559	549	3.1
Final weight, lb	802	822	838	820	25.7
Gain, lb	244	262	279	271	23.1
Daily gain, lb	1.93	2.17	2.20	2.25	0.19
Grazing days/acre	136	128	136	128	-

[a] No significant differences were detected ($P > 0.10$).

[b] Grazing began on December 18, 2001 in year 1, on November 20, 2002 for early seeded pastures and December 5, 2002 for late seeded pastures in year 2.