STEER GRAZING PERFORMANCE ON TIFTON 85 AND COASTAL PASTURES THAT WERE SOD-SEEDED WITH RYEGRASS

G. M. Hill and R. N. Gates

SUMMARY

Effects of autumn sod-seeded ryegrass (Lolium multiflorum; cv. Passerel; 33.6 lb/ac) in bermudagrass pastures (Cynodon spp.; cv. Coastal and cv. Tifton 85) on grazing steer performance were determined in a 3-yr experiment. Ryegrass was sod-seeded in three of six 2-ac pastures of each kind of bermudagrass. Forage height was adjusted to approximately 4 in during spring. The three-yr average stocking rates were not affected by the addition of sod-seeded ryegrass in Tifton 85 pasture, but stocking rates were higher (P < 0.05) for Tifton 85 than Coastal. Ryegrass increased tester steer average daily gains by 34% (1.90 vs 1.41 lb; P < 0.01), and gain/ac by 26% (345 vs 273 lb/ac; P < 0.05). Higher stocking rates resulted in 22% more grazing days (208 vs 170 d/ac; P < 0.01), and 30% higher gain/ac (348 vs 269 lb/ac; P <0.05) for Tifton 85 than Coastal pastures. Sod-seeded ryegrass did not affect stocking rates or steer performance on Tifton 85 pastures, but it depressed performance and stocking rates on Coastal pastures.

INTRODUCTION

Annual ryegrass provides high quality forage during late winter and spring (Bagley et al., 1990; Hoveland et al., 1978) in the southeastern United States and other temperate regions of the world. Interseeding ryegrass into perennial grass sods has increased preweaning calf gains on bermudagrass and bahiagrass (Paspalum notatum) pastures (Hill et al., 1985; Hoveland et al., 1978). Autumn sod-seeding of ryegrass in bermudagrass pastures extended the spring grazing season by 60 to 70 d for yearling cattle (Utley et al., 1978). Mooso (1988) reported depressed common bermudagrass yields following autumn sod-seeding with clover and ryegrass-clover mixtures. Tifton 85 bermudagrass (Burton et al., 1993), has greater DM yield, higher digestibility, and supports higher grazing cattle performance than Coastal and Tifton 78 bermudagrasses (Hill et al., 1993; Hill et al., 1997; Mandebvu et al., 1999). A 3-yr study was conducted to determine effects of autumn ryegrass sod-seeding of Coastal and Tifton 85 pastures on spring stocking rates and steer performance.

MATERIALS AND METHODS

Certified bermudagrass sprigs (cv. Coastal and cv. Tifton 85) were planted in six pastures (2-ac each) of each cultivar on Tifton sandy loam (fine-loamy, siliceous, thermic, Plinthic Kandiudults) soils in 1995. A 3-yr experiment was designed as a 2 × 2 factorial arrangement of bermudagrass (BG) pastures, Coastal (C) or Tifton 85 (T85), with sod-seeded ryegrass (R) or without sod-seeded ryegrass (NR). Three pastures of each BG cultivar were sod-seeded with R (cv. Passerel) each yr (31 October, 1996 and 28 October, 1997, 33 lb/ac; 7 October, 1998, 35 lb/ac) using a no-till sod-seeder. Three pastures of each BG

1Crop Genetics & Breeding Rsch. Unit, USDA-ARS, Coastal Plain Exp. Sta., Tifton, GA.
cultivar were not sod-seeded. Fertilizer was applied to sod-seeded pastures in early December (1996, 24-6-12, N-P₂O₅-K₂O, 250 lb/ac; 1997 and 1998 ammonium nitrate, 33.5% N, 150 lb/ac), and in early February each yr (24-6-12, N-P₂O₅-K₂O, 250 lb/ac). Fertilizer was applied to all pastures (24-6-12, N-P₂O₅-K₂O, 250 lb/ac) in late-March and again in mid-May each yr. Yearling beef steers were assigned by weight to sod-seeded pastures on 6 February, 1997, 8 January, 1998, and 22 January, 1999. Additional steers grazed a R pasture (cv. Passerel; 24 ac) from January to April each yr. Four “tester” steers from the additional R pasture were weighed and assigned to BG pastures without R (1 April, 1997; 9 April, 1998; 15 April, 1999). On these dates, four tester steers from each sod-seeded R pasture were selected, weighed, and continued grazing in a variable stocking rate system (Mott and Lucas, 1952). Steer initial and final weights were means of consecutive daily full weights. Stocking rates were varied to maintain forage height at approximately 4 in. Ground-level forage samples (six/pasture) were dried and used to determine DM yield/ac.

Steer performance data were statistically analyzed as a split-plot in time using mixed model procedures of SAS Inst. Inc., Cary, NC), where replication and appropriate error terms were treated as random effects, treatments and years were treated as fixed effects. Stocking rate and forage mass data were analyzed as a split-split-plot in time using a similar model, and additional fixed effects were linear and quadratic trends over six sampling times and interactions with treatments.

RESULTS AND DISCUSSION

Several commercially available ryegrass cultivars, including Jackson, Marshall and Passerel, have superior cold tolerance and continue to produce forage into late-May and June in most yr. This provides more forage production and extends the grazing season for ryegrass compared with production of Gulf ryegrass. Passerel ryegrass was sod-seeded in C and T85 pastures to provide a stringent test to determine if ryegrass would depress T85 spring forage production. In 1997, R persisted until late June, but in the next two yr spring drought caused R to die by 22 May, 1998, and by 30 April, 1999. The 3-yr mean rainfall (in) with percent of normal rainfall (%; normal=74-yr mean rainfall), respectively, were: March, 3.8, 80.0; April, 3.2, 85.3; May, 2.2, 66.1; and June, 3.6, 80.8. The 3-yr mean total rainfall for these months was 78.6% of normal rainfall for this period of the yr.

In Figure 1, sod-seeding with R reduced stocking rates on CR pastures compared with C on 30 April, 26 May, 9 June, and 22 June, but did not reduce stocking rates of T85 R pastures. Performance of steers (Table 1) indicated that tester steers grazing R pastures had 34% higher average daily gains (ADG; 1.90 vs 1.14 lb; P < 0.01), and 26% higher gain/ac (345 vs 273 lb/ac; P < 0.05) than steers on pastures without R. The T85 pastures were stocked at higher rates than C pastures (Figure 1), but T85 pastures produced more forage than C pastures [forage mass, DM lb/ac, 19 May, 5 June, 20 June, respectively, by BG: C–816, 1024, 1245; T85--1185, 1592, 1489; (P < 0.05)]. The increased forage mass on Tifton 85 pastures occurred in spite of increased steer stocking rates over time. This resulted in 22% more grazing d/ac for T85 (Table 1; 208 vs 170 steer d/ac; P < 0.01), and 30% higher gain/ac for T85 than C pastures (348 vs 269 lb/ac; P < 0.05). Increased steer gains on R pastures were similar to those previously reported (Utley et al., 1978; Bagley et al., 1990). Increased stocking rates and steer gains on T85 pastures were supported by comparisons of Tifton 85 with Tifton 78 pastures (Hill et al., 1993), and Tifton 85 with Coastal and
Tifton 78 BG pastures (Hill et al., 1997). Sod-seeding with ryegrass did not affect forage yield and stocking rates on Tifton 85 pastures during the three yr of this experiment, but sod-seeding with ryegrass greatly reduced forage production and stocking rates on Coastal pastures.

ACKNOWLEDGEMENT

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LITERATURE CITED


Table 1. Three-year mean performance of steers on Coastal or Tifton 85 bermudagrass pastures sod-seeded with Passerel ryegrass.

<table>
<thead>
<tr>
<th>Item</th>
<th>Bermudagrass</th>
<th>Ryegrass</th>
<th>Sod-seeded</th>
<th>SE</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. pastures/yr (2 ac)</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>April 8 wt, lb</td>
<td>823</td>
<td>827</td>
<td>840</td>
<td>810</td>
<td>10.1</td>
</tr>
<tr>
<td>July 2 wt, lb&lt;sup&gt;a&lt;/sup&gt;</td>
<td>968</td>
<td>969</td>
<td>948</td>
<td>989</td>
<td>6.4</td>
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<tr>
<td>Tester ADG, lb (85 d)&lt;sup&gt;ab&lt;/sup&gt;</td>
<td>1.63</td>
<td>1.70</td>
<td>1.41</td>
<td>1.90</td>
<td>0.09</td>
</tr>
<tr>
<td>Steer grazing d, (d/ac)</td>
<td>170</td>
<td>208</td>
<td>198</td>
<td>181</td>
<td>9.1</td>
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<tr>
<td>Gain, (lb/ac)</td>
<td>269</td>
<td>348</td>
<td>273</td>
<td>345</td>
<td>17.7</td>
</tr>
</tbody>
</table>

Acronyms: wt=weight; ADG=average daily gain; d=day; BG=bermudagrass cultivar treatment; R=ryegrass treatment; Y=year.

<sup>a</sup>July 2 wt means adjusted for tester initial weight effect (F=55, **); tester ADG was not affected by tester initial weight (P > 0.15).

<sup>b</sup>Four tester steers assigned to each pasture in April each year; 12 pastures had 48 tester steers each yr.

**P < 0.01; *P < 0.05.

Figure 1. Steer stocking rates on Coastal or Tifton 85 pastures with or without sod-seeded ryegrass (1997, 1998, 1999)