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Comparing Forage Production from Ryegrass, Tall Fescue, and Harding Grass in Central Florida

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Tall fescue (*Festuca arundinaceae*) and annual ryegrass (Lolium multiflorum) are cool season bunch grasses that are widely grown in the warm temperate regions of the United States for forage. They are frost tolerant and can be adapted to supply highly nutritious feed during the winter and spring months in peninsular Florida. Annual ryegrass is already in limited use by Florida dairy and beef producers to supplement cool season grazing. Tall fescue, a perennial cool-season grass, is used primarily as a pasture and hay grass for beef cattle in the south-central and southeastern USA but persistent varieties are lacking in peninsular Florida. Recently, cultivars of harding grass (*Phalaris aquatica*), another cool season perennial, have been selected by AgResearch Ltd. and have been shown to exhibit exceptional persistence in south-central USA regions with dry summers. At Ona, we continue to evaluate production, nutritive value and persistence of perennial cool season grasses in central Florida. In the 2004-2005 season, selected entries from tall fescue (TF) and harding grass (HG) were compared with ryegrass entries.

Two entries of ryegrasses, 11 of tall fescues and three of harding grasses (Table 1) were evaluated during the 2004-2005 fall-spring season. All grasses were seeded on 15 Nov. 2004 at 20 lb seed/A in a well-prepared seedbed. Prior to seeding, the clean tilled soil was fertilized with 0-40-80 lb/A N-P_2O_5-K_2O, plus 2.0 lb/A of Mn, Zn, Cu, and Fe (sulfate form), 0.2 lb/A B, and 4.0 lb/A S. After seed broadcast, seed was lightly incorporated into soil with a straight disk and soil was firmly packed with a heavy roller to promote soil moisture-seed contact. Ammonium nitrate was applied to supply 50 lb N/A to all grasses soon after seedling emergence and 35 lb N/A after each harvest.

The initial ryegrass crop was harvested approximately 50 days after seeding (on 1-5-05) but the TF and HG entries, which are slower growing, were not harvested until 77 days after planting (on 1-31-05). The regrowth of each crop was harvested repeatedly back to a 3-inch stubble about every 30 d. This provided 6 harvests for the ryegrasses but 5 harvests for the TF and HG entries through May 2005. Crabgrass weeds prevented forage harvesting beyond May 2005 and an evaluation of summer live-over persistence for the perennial grasses.

Seasonal ryegrass yield between 5 Jan. and 23 May 2005 from 6 harvests averaged 3.0 T/A which is typical of yield reported for that crop in central Florida. However, seasonal yield of tall fescue and harding grass between 31 Jan and 23 May from 5 harvests averaged 2.5 and 2.1 T/A, respectively (Table 1).

The following discussion compares performance of all grasses at each of 5 harvests. Georgia selection 5 produced the greatest yield for the late-Jan. (1-31-05) harvest of 0.36 T/A compared with an average yield of 0.18 T/A for the remaining entries (Table 1). The 31 Jan. harvest constituted about 8% of the mean seasonal yield for all grasses.

The next harvest, removed on 28 Feb., averaged 0.42 T/A or 17% of mean seasonal yield and showed the ryegrasses and the released TF cultivars, GA-5, Flecha, and KY-31, as among the greatest forage producers. The early maturity TF, FL/OR, had similar yield to the released TF. However, the remaining experimental TF and the HG entries were generally lowest yielding for the 28 Feb. harvest.

Forage yield was very similar for all grass entries in the 29 Mar. harvest, averaging 0.45 T/A or 18% of mean seasonal production. All cool season grass entries exhibited >50% increase in yield between March and April as ambient temperatures and longer daylength became optimal for forage regrowth. Forage yield averaged 0.70 and 0.73 T/A or 28 and 29% of seasonal yield for the April and May harvests, respectively, with only minor differences among the entries.

The two ryegrasses showed slightly different growth patterns. Jumbo exhibited gradual increases in 30-d yield through May with greatest production in April and May (Table 1). Apparently, the wildlife ryegrass was early-maturing and reached steady 30-d peak production from February through May. Both cool season perennial grass species (TF and HG) generally showed major 30-d yield increases between January and February and again between March and April, maintaining similar yields for February and March and for April and May (Table 1).

Conclusions

When the extra early-season yield is considered, the ryegrasses (3.0 T/A) have a clear advantage over the perennials (2.0-2.8 T/A) in cool season forage yield. Additionally, GA-5, Flecha and KY-31 would be among the top-yielding tall fescue cultivars to be considered, whereas the harding grasses were the least productive entries in central Florida. **Unless management strategies are developed to improve upon the long-term**

persistence of currently available cool season perennial grasses, ryegrass and small grains will continue to be the recommended species of choice for winter grazing in peninsular Florida.

Dry matter yield of ryegrass (RG), tall fescue (TF) and harding grass (HG) accessions at the RCREC, Ona for the 2004-2005 season[a]							
	Harvest 1	**Harvest 2**	**Harvest 3**	**Harvest 4**	**Harvest 5**	**Harvest 6**	
Grass Variety	**1/5/05**	**1/31/05**	**2/28/05**	**3/29/05**	**4/26/05**	**5/23/05**	Total
Ryegrass	- - - - - - - - lb/A - - - - - - - -						
Jumbo	(0.26)	0.20	0.54	0.55	0.82	0.70	3.08 a[†]
Wildlife	(0.24)	0.21	0.60	0.56	0.67	0.55	2.83 ab
RG Mean	(0.25)	0.21	0.57	0.56	0.75	0.63	2.96
Tall Fescue[‡]							
GA-5 forage	---	0.36	0.53	0.43	0.78	0.71	2.81 a
Flecha	---	0.28	0.55	0.48	0.67	0.75	2.72 ab
KY-31 forage	---	0.13	0.42	0.45	0.79	0.79	2.58 ab
FL forage	---	0.15	0.35	0.51	0.72	0.84	2.58 ab
UF forage	---	0.23	0.38	0.51	0.68	0.75	2.56 ab
UF-B forage	---	0.17	0.41	0.46	0.73	0.78	2.55 ab
Jessup-E forage	---	0.22	0.48	0.48	0.70	0.66	2.55 ab
FL/OR late	---	0.18	0.37	0.48	0.74	0.78	2.54 ab

FL/OR early	---	0.19	0.44	0.42	0.63	0.80	2.48 b
Jessup-EF forage	---	0.19	0.38	0.47	0.73	0.66	2.42 b
FL/OR turf mid	---	0.12	0.41	0.42	0.66	0.73	2.35 bc
TF Mean	---	0.20	0.43	0.46	0.71	0.75	2.56
Harding grass							
AGR PA 101	---	0.16	0.33	0.37	0.69	0.66	2.22 bc
AGR PA 102	---	0.14	0.28	0.36	0.61	0.77	2.15 c
HGPI C2 Syn	---	0.10	0.30	0.32	0.61	0.73	2.05 c
HG Mean	---	0.13	0.30	0.35	0.64	0.72	2.14
Overall Mean		0.19	0.42	0.45	0.70	0.73	2.50
SEM		0.01	0.01	0.01	0.01	0.01	0.13
Percentage of total yield		8%	17%	18%	28%	29%	

[†]Total yields followed by the same letter(s) are not different at 0.05 level of probability (Pdiff).

[‡]GA-5 = Georgia selection 5, Jessup-E = Georgia Jessup endophyte susceptible, Jessup-EF= Georgia Jessup improved endophyte free, and KY-31 = Kentucky selection 31 are released TF cultivars. Flecha= the experimental AGRFA 103 AGRFA 103TF developed by AgResearch USA Ltd.; FL = Florida; UF = Univ. of Florida; UF-B = Univ. of Florida basic; FL/OR late = FL/OR x 2003 Quincy late maturity forage; FL/OR early = FL/OR x 2003 Quincy early maturity forage; FL/OR turf mid = FL/OR x 2003 mid maturity turf are experimental TF entries. AGRPA 101; AGRPA 102 and HGPI C2 Syn = Cycle 2 Synthetic HG are experimental harding grass (*Phalaris aquatica*) entries developed by AgResearch (USA) Limited.