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Evaluation of Tall Fescue Cultivars

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Evaluation of Tall Fescue Cultivars

Abstract

Tall fescue (*Lolium arundinaceum* Schreb.) is the most widely grown forage grass in southeastern Kansas. Its tolerance to extremes in climate and soils of the region is partly attributable to its association with a fungal endophyte, *Neotyphodium coenophialum*; however, most ubiquitous endophytes are also responsible for production of substances toxic to some herbivores, including cattle, sheep, and horses. Endophytes that purportedly lack toxins, but augment plant vigor have been identified and inserted into tall fescue cultivars adapted to the United States. These cultivars, and others that are fungus-free or contain a ubiquitous endophyte (i.e. Ky 31 EF and HE, respectively) are included in this test.

Keywords

forage production, endophyte

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Evaluation of Tall Fescue Cultivars

J.L. Moyer

Summary

Spring 2017 forage yield was higher for 'NFTF 1411' than for 12 of the 19 other tall fescue cultivar entries. Summer production was greatest for 'BarOptima PlusE34'. Fall production for 'PBU-B2' was higher than for all other entries except 'LE 14-84.' Total 2017 production was greatest for BarOptima PLUS E34, and 'NFTF 1044' yielded more than 15 other cultivars.

Introduction

Tall fescue (*Lolium arundinaceum* Schreb.) is the most widely grown forage grass in southeastern Kansas. Its tolerance to extremes in climate and soils of the region is partly attributable to its association with a fungal endophyte, *Neotyphodium coenophialum*; however, most ubiquitous endophytes are also responsible for production of substances toxic to some herbivores, including cattle, sheep, and horses. Endophytes that purportedly lack toxins, but augment plant vigor have been identified and inserted into tall fescue cultivars adapted to the United States. These cultivars, and others that are fungus-free or contain a ubiquitous endophyte (i.e. Ky 31 EF and HE, respectively) are included in this test.

Experimental Procedures

The trial was seeded at the Mound Valley Unit of the Southeast Agricultural Research Center in 10-in. rows on Parsons silt loam soil. Plots were 35 × 5 ft and were arranged in four randomized complete blocks. They were fertilized with a preplant treatment of 20-50-60 lb/a of N-P₂O₅-K₂O and seeded with 20 lb/a of pure, live seed on September 30, 2014.

Spring 2017 fertilization of 150-60-60 lb/a (N-P₂O₅-K₂O) was applied on February 22, and fall growth was supplemented with 50 lb/a of nitrogen (N) on September 25. Harvest was performed on a 3-ft strip of 16 to 20 ft of each plot. A flail-type harvester was used to cut to a 3-in. height on May 9, 2017. After harvest, forage was removed from the rest of the plot at the same height. A forage subsample was collected from each plot and dried at 140°F for moisture determination. Summer regrowth was similarly harvested on September 21, and fall growth was harvested on November 28.

Results and Discussion

Spring 2017 yields ranged from 2.13 tons/a for Ky31 HE (12% moisture basis) to 2.84 tons/a for NFTF 1411 (Table 1). The latter yielded more ($P < 0.05$) than 13 of the 19 other entries, and five entries yielded more than the three lowest-yielding entries.

Summer forage production was greater than usual, averaging 2.54 tons/a (Table 1). This was largely because precipitation at Mound Valley during July and August was well above average, 4.45 and 9.02 in., respectively, accompanied by cooler-than-average temperatures. BarOptima PLUS E34 yielded more in September than all except three other entries, with the highest-yielding four entries yielding more than two lower-yielding entries.

Fall production averaged 0.73 tons/a, with PBU-B2 and LE 14-84 yielding more than nine other entries (Table 1). Total forage production for 2017 was greater for BarOptima PLUS E34 than that of 17 other cultivars, the exceptions being NFTF 1044 and PBU-B2.

Total 3-year forage production of PBU-B2, PBU-B7, and NFTF 1044 exceeded 22 tons/a, which was greater than that of seven other entries (Table 1). Six entries exceeded the three-year forage production of 'Martin 2 ProTek.'

Table 1. Forage yields (tons/a, 12% moisture) in 2017, and 3-year total yield for the tall fescue cultivar trial seeded in 2014, Mound Valley Unit, Kansas State University Southeast Agricultural Research Center

Cultivar	2017 Forage yields			Total	3-Year total yield
	May 9	September 21	November 28		
BarOptima PLUS E34	2.60	3.15	0.74	6.48	20.22
Bar FAF 131	2.59	2.37	0.67	5.63	19.66
Tower ProTek	2.42	2.56	0.81	5.78	20.83
Martin 2 ProTek	2.54	2.23	0.66	5.43	18.98
AGRFA 148	2.69	2.57	0.61	5.86	20.01
NFTF 1051	2.21	2.79	0.70	5.69	21.25
NFTF 1044	2.81	2.89	0.68	6.37	22.09
NFTF 1411	2.84	2.43	0.56	5.82	19.50
GT 213	2.25	2.39	0.75	5.38	19.68
LE 14-84	2.32	2.52	0.90	5.74	20.11
LE 14-86	2.34	2.47	0.68	5.49	20.81
Teton II	2.48	2.30	0.81	5.59	20.42
Estancia	2.31	2.49	0.66	5.46	20.40
PBU-B1	2.33	2.42	0.75	5.50	21.38
PBU-B2	2.51	2.57	1.01	6.09	22.37
PBU-B5	2.41	2.48	0.82	5.72	20.97
PBU-B7	2.36	2.76	0.79	5.90	22.22
MV 14	2.53	2.57	0.72	5.82	20.68
Ky 31 HE	2.13	2.45	0.82	5.40	19.66
Ky 31 LE	2.46	2.44	0.52	5.42	20.68
Average	2.42	2.54	0.73	5.72	20.61
LSD (0.05)	0.31	0.45	0.17	0.52	1.95