



2000 Tall Fescue Report

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Introduction

Tall fescue (*Festuca arundinacea*) is a productive, well-adapted, persistent, soil-conserving, cool-season grass that is grown on approximately 5.5 million acres in Kentucky. This grass, used for both hay and pasture, is the forage base of most of Kentucky's livestock enterprises, particularly beef cattle.

Much of the tall fescue in Kentucky is infected with an internal fungus (endophyte) that results in decreased weight gains in growing ruminants and lower pregnancy rates in breeding stock, especially in hot weather. Varieties are now available that are free of this fungal endophyte.

This report provides current yield data on tall fescue varieties (plus a few bluegrass and perennial ryegrass varieties) in trials in Kentucky as well as guidelines for selecting tall fescue varieties.

Important Considerations in Selecting a Tall Fescue Variety

Local adaptation and seasonal yield. The variety should be adapted to Kentucky as indicated by good performance across years and locations in replicated yield trials such as those presented in this publication. Choose high-yielding varieties, but choose varieties that are productive during the desired season of use.

Tall fescues are often classified as either "Mediterranean" or "European" types according to the area from which the parental material for the variety came. In general, the Mediterranean types (Cajun and Fawn, for example) are more productive in the fall and winter than the European types such as Kentucky 31. Although they mature earlier in the spring, the Mediterranean types become very dormant and nonproductive during the summer in Kentucky and are more susceptible than European varieties to some leaf diseases such as *Helminthosporium* and *Rhizoctonia*. Therefore, Mediterranean varieties are less preferred for use in Kentucky than European types. Because Mediterranean varieties mature earlier in the spring, first-cutting yields are generally higher for these varieties when the two types are harvested at the same time. However, the European types produce more in the summer, allowing for extended grazing.

Endophyte level. Make sure the seed has been tested for endophyte content. Seed with infection levels of less than 5% is regarded as being endophyte free. This information will be prominently displayed on a green tag attached to the seed bag. If no tag

is present, assume the seed is infected with the endophyte. Several varieties, both with and without the endophyte, are adapted for use in Kentucky as determined by the tests in this report.

Seed quality. Buy high-quality seed that is high in germination and purity and free from weed seed. Buy certified seed or proprietary varieties of seed of an improved variety. An improved variety is one that has performed well in independent trials. Other information on the label will include the test date, which must be within the previous nine months, and the level of germination and other crop and weed seed. Order seed well in advance of planting time to assure that it will be available when needed.

Description of the Tests

Data from three studies are reported. Tall fescue varieties were sown at Princeton (1998), Lexington (1999), and Quicksand (1999). The soils at Princeton (Crider), Lexington (Maury), and Quicksand (Pope) were well-drained silt loams. All are well suited for tall fescue production.

Seedings were made at the rate of 20 lb/A into a prepared seedbed with a disk drill. Plots were 5' x 15' in a randomized complete block design with four replications. Nitrogen was topdressed at 80 lb/A of actual N in March (60 lb/A for newly seeded stands) and 60 lb/A of actual N after the first cutting and again in late summer. The tests were harvested using a sickle-type forage plot harvester to simulate a spring cut hay/summer grazing/fall stockpile management system. The first cutting was harvested at each location when all tall fescue varieties had reached at least the boot stage. Fresh weight samples were taken at each harvest to calculate dry matter production. Management practices for these tests regarding establishment, fertility, weed control, and harvest timing were in accordance with University of Kentucky recommendations.

Results and Discussion

Weather data for 2000 for Princeton, Lexington, and Quicksand are presented in Table 1. In general, temperature and moisture in 2000 were closer to normal than in recent years.

Ratings for maturity and dry matter yields (tons/acre) are reported in Tables 2 through 4. Yields are given by cutting date and as total annual production. Varieties are listed by total yield in descending order. Experimental varieties are listed separately at the bottom of the tables and are not available commercially.

Statistical analyses were performed on all data (including experimentals) to determine if the apparent differences are truly due to varietal differences or just to chance. In the tables, varieties that are not significantly different from the top variety in the column for that characteristic are marked with one asterisk (*). To determine if two varieties are truly different, compare the difference between them to the LSD (Least Significant Difference) at the bottom of the column. If the difference is equal to or greater than the LSD, the varieties are truly different when grown under the conditions at the given locations. The Coefficient of Variation (CV) is a measure of the variability of the data and is included for each column of means. Low variability is desirable, and increased variability within a study results in higher CVs and larger LSDs.

Most of the tall fescue varieties tested are free of the endophyte. For best results in establishing a stand of endophyte-free tall fescue, plant in late summer and take the first harvest the following year as hay. This management will allow the plants to become firmly established before these fields are moved into a pasture rotation. After this cutting, follow recommendations about pasture fertilization and grazing rotation. Take care not to overgraze low endophyte tall fescue, especially during periods of extreme drought stress.

Table 5 summarizes information about distributors, endophyte infection, and yield performance across locations for all varieties currently included in tests discussed in this report. Varieties are listed in alphabetical order by species, with the experimental varieties at the bottom. Remember that experimental varieties are not available for farm use, while commercial varieties can be purchased from agricultural distributors. In Table 5, a shaded area indicates that the variety was not in that particular test (labeled at the top of the column), while a clear block means that the variety was in the test. A single asterisk (*) means that the variety was not significantly different from the top variety. It is best to choose a variety that has performed well over several years and locations. Remember to consider the relative spring maturity and the distribution of yield across the growing season when evaluating productivity of tall fescue varieties (Tables 2-4).

Summary

Selecting a good endophyte-free variety of tall fescue is an important first step in establishing a productive stand of grass. Proper management, beginning with seedbed preparation and continuing throughout the life of the stand, is necessary for even the highest-yielding variety to produce to its genetic potential.

Table 1. Temperature and rainfall at Princeton, Lexington, and Quicksand in 2000.

	Princeton				Lexington				Quicksand			
	Temp		Rainfall		Temp		Rainfall		Temp		Rainfall	
MON	°F	DEP	IN	DEP	°F	DEP	IN	DEP	°F	DEP	IN	DEP
JAN	38	+4	5.86	+2.06	32	+1	3.48	+0.62	34	+3	2.25	-1.04
FEB	47	+9	5.36	+0.93	43	+8	4.97	+1.76	44	+11	3.12	-0.48
MAR	54	+7	4.23	-0.71	48	+4	3.47	-0.93	51	+10	2.16	-2.18
APR	59	0	5.77	+0.97	53	-2	4.10	+0.22	55	+2	4.55	+0.45
MAY	70	+3	5.03	+0.07	67	+3	2.96	-1.51	68	+6	7.79	+3.31
JUN	76	+1	3.07	-0.78	73	+1	3.22	-0.44	73	+3	8.86	+5.04
JUL	78	0	4.51	+0.22	74	-2	3.42	-1.58	73	-1	4.16	-1.09
AUG	80	+3	1.99	-2.02	74	-2	3.38	-0.55	73	0	6.24	+2.23
SEP	71	0	4.13	+0.80	66	-2	5.47	+2.27	67	+1	3.84	+0.32
OCT	64	+5	1.15	-1.90	59	+2	0.92	-1.65	59	+5	0.43	-2.48
NOV	47	0	4.01	-0.62	43	-2	1.59	-1.80	46	+4	1.11	-2.77

DEP is departure from the long-term average for that location.

Table 2. Dry matter yields (tons/acre) of tall fescue varieties and a perennial ryegrass (PRG) sown 12 October 1998 at Princeton, Kentucky.

Variety	Maturity ¹ May 15, 2000	1999 Total	2000 Harvests			2000 Total	2-yr Total
			May 15	Jun 22	Jul 21		
Commercial Varieties — Available for Farm Use							
Polly II (PRG) †	55.25	7.65	3.58	1.94	0.48	6.00	13.65
KY 31+ ²	61.50	4.89 *	3.61 *	0.95 *	0.97 *	5.53 *	10.43 *
Jesup EF	66.75 *	4.23	3.16	0.78	0.85	4.78	9.01
Select	64.00	3.88	3.33 *	0.90 *	0.84	5.06 *	8.95
Vulcan	58.25	3.36	3.01	0.93 *	0.98 *	4.92	8.28
TF 33	61.00	2.59	1.58	0.93 *	0.88 *	3.38	5.97
Experimental Varieties — Not Available for Farm Use							
KYTF2	60.25	4.63 *	3.60 *	0.92 *	0.90 *	5.42 *	10.04 *
KY31- ²	65.00 *	4.78 *	3.34 *	0.86	0.93 *	5.12 *	9.90 *
Jesup EI	66.25 *	4.63 *	3.15	0.97 *	1.09 *	5.21 *	9.84 *
Ampac pp1	58.25	4.51 *	3.36 *	1.09 *	0.61	5.06 *	9.56
KYFA 9301	64.50 *	4.31 *	3.20 *	0.96 *	0.84	4.99	9.31
Jesup 502	64.00	4.38 *	3.17 *	0.84	0.88 *	4.89	9.28
Jesup 542	64.50 *	4.19	2.94	0.81	0.88 *	4.63	8.82
Georgia 5-542	65.50 *	4.02	2.99	0.75	0.84	4.59	8.61
Ampac 1	63.25	3.33	2.95	0.83	1.17 *	4.96	8.29
Mean	63.07	4.12	3.21	0.89	0.90	5.02	9.14
CV, %	2.94	11.12	9.64	17.17	22.97	7.42	8.13
LSD, 0.05	2.65	0.66	0.44	0.22	0.30	0.53	1.06

* Not significantly different from the highest value for tall fescue entries in the column, based on the 0.05 LSD.

† For the purposes of this experiment, the Polly II data were not included in the statistical analysis because there is no other PRG for comparison and its high yield masks the differences among tall fescues.

¹ Maturity rating scale: 37 = flag leaf emergence, 45 = boot swollen, 50 = beginning of inflorescence, 58 = complete emergence of inflorescence, 62 = beginning of pollen shedding.

² "+" indicates variety is endophyte infected; "-" indicates variety is endophyte free.

Table 3. Dry matter yields (tons/acre) of tall fescue and festulolium (FL) varieties sown 23 August 1999 at Lexington, Kentucky.

Variety	2000 Harvests						2000 Total
	May 9	Jun 14	Jul 27	Aug 28	Oct 18	Nov 24	
Commercial Varieties — Available for Farm Use							
Duo (FL)	5.49 *	1.87 *	1.29	0.93	0.94	0.52	11.04 *
Atlas	2.96	1.49 *	1.92 *	1.53 *	1.63 *	0.77 *	10.30 *
Select	3.62	1.54 *	1.85 *	1.25	1.26	0.52	10.03 *
Ky31+ ¹	3.20	1.45	1.81 *	1.31 *	1.33	0.50	9.60 *
Fuego	3.29	1.41	1.41	1.25	1.34	0.63 *	9.33 *
Bar 9 TMPO	2.97	1.34	1.58	1.18	1.45 *	0.63 *	9.15 *
Seine	2.57	1.23	1.71	1.27	1.52 *	0.63 *	8.93 *
Johnstone	3.09	1.38	1.66	1.19	1.13	0.44	8.89
Maximize	2.64	1.28	1.70	1.28	1.39	0.59	8.88
DLF-B	3.00	1.26	1.47	1.23	1.32	0.58	8.86
Experimental Varieties — Not Available for Farm Use							
BARFABTR 7	3.36	1.40	2.08 *	1.48 *	1.68 *	0.75 *	10.75 *
Ampac-pp7	4.89 *	1.85 *	1.17	1.15	1.01	0.34	10.41 *
KYFA 9304	3.50	1.50 *	2.07 *	1.41 *	1.41 *	0.49	10.39 *
BARFABTR 6	2.98	1.52 *	1.99 *	1.42 *	1.61 *	0.73 *	10.24 *
Jesup 584	3.42	1.59 *	1.81 *	1.35 *	1.44 *	0.51	10.11 *
Ampac-pp3	5.08 *	1.81 *	0.90	1.01	0.88	0.43	10.10 *
TF 9202	3.21	1.64 *	1.85 *	1.37 *	1.42 *	0.53	10.03 *
Ampac-pp8	5.00 *	1.80 *	0.88	0.86	0.77	0.47	9.78 *
GA 7clone-542	3.72	1.58 *	1.13	1.23	1.38	0.66 *	9.70 *
GA 5-584	3.13	1.49 *	1.61	1.34 *	1.34	0.58	9.49 *
Jesup 542	3.01	1.25	1.80 *	1.36 *	1.29	0.57	9.29 *
KYTF2	3.14	1.28	1.73	1.28	1.22	0.46	9.10 *
KYFA 9301	1.73	1.53 *	1.86 *	1.42 *	1.36	0.50	8.40
GA 153e-542	2.85	1.21	1.41	1.17	1.18	0.52	8.33
Ky31- ¹	1.17	1.45	1.91 *	1.50 *	1.50 *	0.56	8.09
GA 156L 542	2.57	0.96	1.41	1.11	1.14	0.45	7.64
Mean	3.29	1.47	1.62	1.27	1.31	0.55	9.50
CV, %	33.99	19.01	16.22	12.42	15.75	18.23	15.85
LSD, 0.05	1.58	0.39	0.37	0.22	0.29	0.14	2.12

* Not significantly different from the highest value in the column, based on the 0.05 LSD.

¹ "+" indicates variety is endophyte infected; "-" indicates variety is endophyte free.

Table 4. Dry matter yields (tons/acre) of tall fescue varieties sown 13 September 1999 at Quicksand, Kentucky.							
Variety	Vigor 26 Oct 1999	Maturity 26 May 2000	2000 Harvests				2000 Total
			May 26	Jun 30	Aug 17	Dec 11	
Commercial Varieties — Available for Farm Use							
Select	3.50	63.75	3.34 *	0.99 *	1.57 *	1.39 *	7.29 *
Ky 31+ ¹	4.00	65.00	3.35 *	1.07 *	1.38 *	1.44 *	7.24 *
Maximize	3.50	66.50	2.90 *	1.11 *	1.37 *	1.49 *	6.86 *
Bar 9 TMPO	3.25	65.00	2.83 *	1.00 *	1.33 *	1.50 *	6.67 *
Johnstone	3.75	62.25	2.64 *	0.89	1.30 *	1.15	5.99 *
Atlas	4.25 *	70.25 *	1.34	1.22 *	1.26 *	1.44 *	5.26
Experimental Varieties — Not Available for Farm Use							
KYFA 9301	3.75	62.50	3.34 *	1.20 *	1.24 *	1.45 *	7.24 *
TF 9202	3.00	65.75	3.19 *	1.12 *	1.39 *	1.54 *	7.23 *
KYFA 9304	4.00	64.50	3.15 *	1.06 *	1.56 *	1.39 *	7.16 *
Ky 31- ¹	3.50	65.00	3.18 *	0.87	1.29 *	1.33 *	6.67 *
Jesup (542)	3.75	67.25 *	3.41 *	0.74	1.22 *	1.26	6.63 *
Jesup (584)	3.50	65.25	3.28 *	0.80	1.12	1.24	6.44 *
Ga 5 (584)	3.75	67.00	2.77 *	0.97	1.25 *	1.43 *	6.42 *
KYTF 2	3.50	62.50	3.17 *	0.91	1.06	1.21	6.35 *
Ampac pp8	5.00 *	65.50	2.72 *	0.86	1.14	0.44	5.15
Mean	3.73	65.2	3.00	0.99	1.30	1.31	6.57
CV, %	15.70	3.49	31.16	17.38	23.20	13.54	16.78
LSD, 0.05	0.84	3.25	1.32	0.25	0.43	0.25	1.57
* Not significantly different from the highest value in the column, based on the 0.05 LSD. ¹ "+" indicates variety is endophyte infected; "-" indicates variety is endophyte free.							

Table 5. Performance of tall fescue, festulolium (FL), and perennial ryegrass (PRG) varieties across years and locations.		Princeton		Lexington	Quicksand
		1998 ¹		1999	1999
Variety	Proprietor/KY Distributor	99 ²	00	00	00
Commercial Varieties — Available for Farm Use					
Atlas	AgriBioTech			*	
Bar 9 TMPO	Barenbrug USA			*	*
DLF-B	DLF-Trifolium				
Duo (FL)	Ampac Seed Co.			*	
Fuego	Advanta Seeds West/Oldfields Seeds			*	
Jesup EF	Pennington Seed				
Johnstone	AgriBioTech				*
Ky 31+ ³	KY Agric. Exp. Sta./Public		*	*	*
Maximize	Turf-Seed, Inc.				*
Polly II (PRG)	FFR Cooperative	*	*		
Seine	Advanta Seeds West			*	
Select	FFR Cooperative		*	*	*
TF33	Barenbrug USA				
Vulcan	International Seeds		*		
Experimental Varieties — Not Available for Farm Use					
Ampac 1	Ampac Seed Company		*		
Ampac pp1	Ampac Seed Company		*		
Ampac pp3	Ampac Seed Company			*	
Ampac pp7	Ampac Seed Company			*	
Ampac pp8	Ampac Seed Company			*	
BARFABTR 6	Barenbrug USA			*	
BARFABTR 7	Barenbrug USA			*	
GA 153e 542	GA Agric. Exp. Sta./Experimental				
GA 156L 542	GA Agric. Exp. Sta./Experimental				
GA 5-542	GA Agric. Exp. Sta./Experimental				
GA 5 584	GA Agric. Exp. Sta./Experimental			*	*
GA 7clone 542	GA Agric. Exp. Sta./Experimental			*	
Jesup EI	GA Agric. Exp. Sta./Experimental		*		
Jesup 502	GA Agric. Exp. Sta./Experimental		*		
Jesup 542	GA Agric. Exp. Sta./Experimental			*	*
Jesup 584	GA Agric. Exp. Sta./Experimental			*	*
Ky 31- ³	KY Agric. Exp. Sta./Experimental		*		*
KYFA 9301	KY Agric. Exp. Sta./Experimental		*		*
KYFA 9304	KY Agric. Exp. Sta./Experimental			*	*
KYTF 2	KY Agric. Exp. Sta./Experimental		*	*	*
TF 9202	AgriBioTech			*	*
¹ Establishment year ² Harvest year ³ "+" indicates variety is endophyte infected; "-" indicates variety is endophyte free. * Not significantly different from the highest-yielding variety in the test. Shaded boxes indicate that the variety was not in the test. Open boxes indicate the variety was in the test but yielded significantly less than the top-ranked variety in the test.					

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