



The 1999 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 is used for both hay and pasture and 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 non-productive 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; 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 Lexington (1996 and 1997) and Princeton (1998). The soils at Lexington (Maury) and Princeton (Crider) are 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 ft x 15 ft 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 1999 for Lexington and Princeton are presented in Table 1. The year 1999 was a drought year with above-average temperatures. Plant growth was significantly reduced in all trials.

Ratings for maturity and dry matter yields (tons/A) are reported in Tables 2 through 4. Yields are given by cutting date and as total annual production. Varieties are listed by descending maturity rating or by descending total yield. 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 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 in 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 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 Lexington and Princeton in 1999.

MON	Lexington				Princeton			
	Temp		Rainfall		Temp		Rainfall	
	°F	DEP	IN	DEP	°F	DEP	IN	DEP
JAN	36	+5	5.64	+2.78	40	+6	8.82	+5.02
FEB	40	+5	2.32	-0.89	46	+8	2.22	-2.21
MAR	40	-4	3.27	-1.13	46	-1	4.07	-0.87
APR	56	+1	1.87	-2.01	63	+4	5.85	+1.05
MAY	65	+1	1.35	-3.12	68	+1	3.34	-1.62
JUN	74	+2	3.89	+0.23	76	+1	4.52	+0.67
JUL	80	+4	1.00	-4.00	82	+4	4.61	+0.32
AUG	75	0	1.31	-2.62	79	+2	1.00	-3.01
SEP	69	+1	1.03	-2.17	73	+2	0.72	-2.61
OCT	57	0	1.91	-0.66	62	+3	3.45	+0.40
NOV	51	+6	1.70	-1.69	57	+10	3.22	-1.41

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

Table 2. Dry matter yields (tons/A) and maturity ratings for tall fescue, bluegrass (BG), and festulolium (FL) varieties sown on 23 August 1996 at Lexington, Kentucky.

Variety	Maturity ¹ May 5 1999	1997 Total	1998 Total	May 10 1999	1999 Total	3-yr Total
Commercial Varieties—Available for Farm Use						
Stargrazer	48.4	8.28 *	6.19 *	1.82	1.82	16.29 *
KY31+ ²	50.5	7.74	6.12 *	2.03 *	2.03 *	15.89 *
Dovey	53.3	6.99	6.73 *	1.82	1.82	15.54 *
Barcel	45.3	7.02	5.78	1.85	1.85	14.64
Festorina (FL)	46.9	7.00	5.22	1.86	1.86	14.08
Lato (BG)	55.6	5.33	4.70	1.62	1.62	11.65
Kenblue (BG)	60.3 *	3.81	4.61	1.21	1.21	9.62
Experimental Varieties—Not Available for Farm Use						
TF9201	50.1	8.81 *	6.15 *	2.00 *	2.00 *	16.96 *
KY31- ²	48.8	8.37 *	6.30 *	2.13 *	2.13 *	16.79 *
KYTF2	47.4	8.26 *	6.50 *	1.76	1.76	16.53 *
KYFA9403	49.0	8.14 *	6.53 *	1.82	1.82	16.49 *
KYFA9303	51.0	7.65	6.74 *	1.94 *	1.94 *	16.33 *
KYFA9304	48.3	7.77	6.15 *	1.95 *	1.95 *	15.88 *
TF9005	50.4	7.23	6.19 *	2.16 *	2.16 *	15.58 *
KYFA9404	55.5	7.13	6.25 *	1.86	1.86	15.23
GA156	50.9	7.19	6.02 *	1.95 *	1.95 *	15.15
KYFA9302	52.3	7.40	5.80	1.90 *	1.90 *	15.10
BARFA4113	46.8	7.45	5.79	1.65	1.65	14.89
KYFA9301	48.8	7.45	5.69	1.73	1.73	14.87
FA89K	49.0	7.39	5.61	1.76	1.76	14.75
BARFA6FRD	48.4	7.07	5.79	1.85	1.85	14.71
BARFA2HG	48.0	6.77	5.44	1.80	1.80	14.01
GA153	52.6	5.89	5.89	1.93 *	1.93 *	13.71
Mean	50.30	7.22	5.92	1.84	1.84	14.99
CV,%	3.86	9.67	9.50	10.71	10.71	6.91
LSD, 0.05	2.74	0.99	0.79	0.28	0.28	1.46

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

¹ Maturity rating scale: 37=flag leaf visible, 45=boot swollen, 50=beginning of inflorescence emergence, 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/A) and maturity ratings for tall fescue, festulolium (FL), and perennial ryegrass (PRG) varieties sown 11 September 1997 at Lexington, Kentucky.

Variety	Maturity ¹ May 5, 1999	1998 Total	1999 Harvests		1999 Total	2-yr Total
			May 10	Jul 9		
Commercial Varieties—Available for Farm Use						
Quincy	50.63	3.81	2.65 *	0.71 *	3.35 *	7.16 *
Tandem (FL)	40.63	4.38	2.25	0.58	2.83	7.21*
WFL96 (FL)	39.56	4.25	2.47 *	0.44	2.91	7.16*
Bestfor (PRG)	43.38	5.10 *	1.46	0.59	2.06	7.16*
Boxer (PRG)	39.88	4.23	2.28	0.57	2.85	7.08*
JesupEF	52.00	3.35	2.86	0.66 *	3.52*	6.87*
KY31+ ²	48.13	3.13	2.74 *	0.80 *	3.54*	6.68*
Amazon (PRG)	38.38	3.64	2.47 *	0.41	2.88	6.52*
Kemal (FL)	39.69	3.67	2.35	0.41	2.77	6.44*
Martin II	52.13	3.32	2.27	0.60	2.88	6.20
Seine	46.88	3.25	2.06	0.73 *	2.79	6.04
Festorina (FL)	46.75	3.11	2.23	0.71 *	2.94	6.05
Fuego	45.50	3.30	1.95	0.73 *	2.68	5.98
Quantum	56.63 *	3.04	2.05	0.68 *	2.73	5.76
Johnstone	48.13	2.81	2.30	0.76 *	3.07 *	5.88
Tetramax (PRG)	38.13	3.27	2.36	0.36	2.72	5.99
Bull	52.63	2.83	1.82	0.59	2.41	5.24
Experimental Varieties—Not Available for Farm Use						
KYFA9402	49.88	3.84	2.68 *	0.75 *	3.43 *	7.28 *
KYFA9304	49.00	4.02	2.48 *	0.69 *	3.17 *	7.19 *
KY31- ²	49.38	3.38	2.61 *	0.72 *	3.33 *	6.71 *
KYTF2	45.63	3.66	2.19	0.76 *	2.95	6.62 *
B-1	54.25	3.27	2.34	0.81 *	3.15 *	6.42 *
KYFA9401	49.88	3.52	2.15	0.75 *	2.91	6.42 *
KYFA9301	48.25	3.06	2.62 *	0.73 *	3.35 *	6.40 *
KYFA9403	47.88	3.18	2.27	0.71 *	2.98	6.16
TF8805	49.63	3.05	2.47 *	0.57	3.04 *	6.09
KYFA9302	51.00	3.28	2.06	0.72 *	2.78	6.06
WVPB-BR31	37.88	2.72	1.76	0.66 *	2.43	5.14
TF8503	48.50	2.36	2.04	0.57	2.62	4.97
WVPB TF500	48.00	2.08	2.29	0.57	2.86	4.95
Mean	46.30	3.46	2.29	0.63	2.92	6.38
CV, %	3.43	14.26	14.13	19.02	13.91	10.58
LSD, 0.05	2.17	0.68	0.44	0.16	0.56	0.92

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

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 4. Dry matter yields (tons/A) and maturity ratings for tall fescue and perennial ryegrass (PRG) varieties sown 12 October 1998 at Princeton, Kentucky.

Variety	Maturity ¹ May 20, 1999	1999 Harvests				1999 Total
		May 20	Jun 16	Jul 20	Nov 11	
Commercial Varieties—Available for Farm Use						
Polly II (PRG)	53.50	3.73 *	2.74 *	1.18	0.12	7.77 *
KY31+ ²	39.00	1.75	1.31	1.84 *	0.78 *	5.67
JesupEF	45.25	1.51	1.15	1.57 *	0.81 *	5.03
Select	52.00	1.51	1.08	1.29	0.85 *	4.73
Vulcan	39.00	1.14	1.09	1.13	0.40	3.76
TF33	50.50	0.88	0.78	0.93	0.64	3.23
Experimental Varieties—Not Available for Farm Use						
KY31- ²	40.25	1.89	1.29	1.60 *	0.83 *	5.61
JesupEI	41.50	1.64	1.27	1.72 *	0.89 *	5.52
KYTF2	39.75	1.70	1.26	1.67 *	0.56	5.19
Jesup502	61.75 *	2.15	1.05	1.19	0.77 *	5.16
Ampac-pp1	59.25 *	2.44	1.17	0.90	0.58	5.08
KYFA9301	41.00	1.57	1.16	1.59 *	0.70 *	5.01
Jesup542	61.00 *	2.04	1.05	1.09	0.70 *	4.88
Georgia5-542	60.75 *	2.12	1.00	0.90	0.66	4.68
Ampac-1	52.50	1.15	0.93	1.25	0.60	3.94
Mean	49.13	1.81	1.22	1.32	0.66	5.02
CV,%	9.44	14.97	12.89	15.07	24.46	9.59
LSD, 0.05	6.62	0.39	0.23	0.29	0.23	0.69

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

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.



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Table 5. Performance of tall fescue, bluegrass (BG), festulolium (FL), and perennial ryegrass (PRG) varieties and chicory across years and locations.		Lexington					
		1996 ¹			1997		1998
Variety	Proprietor/KY Distributor	97 ²	98	99	98	99	99
Commercial Varieties—Available for Farm Use							
Amazon (PRG)	Willamette Seed Co.						
Bull	D.L.F. Trifolium						
Barcel	Barenbrug Research/Barenbrug USA						
Bestfor (PRG)	D.L.F. Trifolium				*		
Boxer (PRG)	Willamette Seed Co.						
Dovey	Barenbrug Research/Barenbrug USA		*				
Festorina (FL)	Advanta Seeds West/Oldfields Seeds						
Fuego	Advanta Seeds West/Oldfields Seeds						
JesupEF	Pennington Seed						
Johnstone	Willamette Seed Co./Public					*	
Kemal (FL)	Danish Plant Breeders						
Kenblue (BG)	KY Agric. Exp. Sta./Public						
KY31+ ³	KY Agric. Exp. Sta./Public		*	*			
Lato (BG)	Turf-Seed Inc.						
Martin II	International Seeds Inc.						
Orygun	Turner Seeds						
Polly II (PRG)	FFR Cooperative						*
Puna (chicory)	Burlingham Seeds						
Quantum	International Seeds Inc.						
Quincy	University of Florida					*	
Seine	Advanta Seeds West						
Select	FFR Cooperative						
Stag	Cascade International						
Stargrazer	FFR/Southern States	*	*				
Tandem (FL)	Advanta Seeds West						
Tetramax (PRG)	D.L.F. Trifolium						
TF33	Barenbrug USA						
Vulcan	International Seeds						
WFL96 (FL)	University of Wisconsin						
Experimental Varieties—Not Available for Farm Use							
Ampac-1	Ampac Seed Co.						
Ampac-pp1	Ampac Seed Co.						
B-1						*	
BARFA2HG	Barenbrug Research/Experimental						
BARFA4113	Barenbrug Research/Experimental						
BARFA6FRD	Barenbrug Research/Experimental						
EA30	Cascade International						
EA70	Cascade International						
FA89K	Barenbrug Research/Experimental						
GA153	GA Agric. Exp. Sta./Experimental			*			
GA156	GA Agric. Exp. Sta./Experimental		*	*			
Georgia5-542	GA Agric. Exp. Sta./Experimental						
JesupEI	GA Agric. Exp. Sta./Experimental						
Jesup502	GA Agric. Exp. Sta./Experimental						
Jesup542	GA Agric. Exp. Sta./Experimental						
KY31- ³	KY Agric. Exp. Sta./Experimental	*	*	*		*	
KYFA9301	KY Agric. Exp. Sta./Experimental					*	
KYFA9302	KY Agric. Exp. Sta./Experimental			*			
KYFA9303	KY Agric. Exp. Sta./Experimental		*	*			
KYFA9304	KY Agric. Exp. Sta./Experimental		*	*		*	
KYFA9401	KY Agric. Exp. Sta./Experimental						
KYFA9402	KY Agric. Exp. Sta./Experimental					*	
KYFA9403	KY Agric. Exp. Sta./Experimental	*	*				
KYFA9404	KY Agric. Exp. Sta./Experimental		*				
KYTF2	KY Agric. Exp. Sta./Experimental	*	*				
OFIB-1	Olsen-Fennell Seeds Inc.						
TF8503	Royal Seeds West						
TF8805	FFR Cooperative					*	
TF9005	Barenbrug Research/Experimental		*	*			
TF9201	FFR Cooperative	*	*	*			
WVBP-BR31 (Brome)	D.L.F. Trifolium						
WVBP TF500	Western Production Inc.						

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.