

# The 1997 Tall Fescue Report

J.C. Henning, R. Spitaleri, T.D. Phillips, G.D. Lacefield, D.C. Ditsch, and E.L. Baker

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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. While 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 percent are 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 will be reported. Tall fescue varieties were sown at Lexington (1995 and 1996) and at Princeton (1996). The soils at Lexington (Maury) and Princeton (Crider) were well-drained silt loams. Both are well suited to tall fescue production.

Seedings were made at the rate of 20 lb/A into a prepared seedbed with a disk drill. Plots were 4' 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 weights were measured in the field and converted to dry matter production using long-term averages for percent dry matter of tall fescue. Management goals for all tests for establishment, fertility, weed control, and harvest management were to limit the factors affecting yield to variety and environment.

## Results and Discussion

Weather data for 1997 for Lexington and Princeton are presented in Table 1. In general, 1997 was wetter and cooler than average in April, May, and June at both locations. High rainfall in late May and June led to second cutting yields that were comparable to those of first cuttings. Lexington temperatures were below long-term averages for the year. Summer and fall rainfall was lower than average at both locations.

Ratings for percent stand and 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 descending maturity rating or by descending total yield. Experimental varieties are listed separately at the bot-

tom 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 random 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, plant in late summer and take the first harvest the following year as hay. This management will allow the plants to get 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, shaded areas indicate that the variety was not in

that particular test (labeled at the top of the column), while clear blocks mean 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.

AGR-1	Lime and Fertilizer Recommendations
AGR-18	Grain and Forage Crop Guide for Kentucky
AGR-26	Renovating Hay and Pasture Fields
AGR-44	Season of the Year Affects Nutritional Value of Tall Fescue
AGR-59	Tall Fescue
AGR-64	Establishing Forage Crops
AGR-103	Fertilization of Cool-season Grasses
AGR-108	Tall Fescue in Kentucky
AGR-119	Alternatives for Fungus-infected Tall Fescue
AGR-126	Replacement of an Endophyte-infected Tall Fescue Stand
	Seed Tags: What They Reveal
ASC-16	Beef: Grass Tetany in Beef Cattle
PPA-9	Collecting Plant Specimens for Disease Diagnosis
PPA-30	Sampling for the Tall Fescue Endophyte in Hay and Pasture Fields

## Authors

J.C. Henning—*Extension Full Professor, Forages, UK Department of Agronomy*

R. Spitaleri—*Research Specialist, UK Department of Agronomy*

T.D. Phillips—*Associate Professor, Tall Fescue Breeding, UK Department of Agronomy*

G.D. Lacefield—*Extension Full Professor, Forages, UK Department of Agronomy*

D.C. Ditsch—*Extension Associate Professor, Feed Production, UK Department of Agronomy*

E.L. Baker—*Research Analyst, Tall Fescue Breeding, UK Department of Agronomy*

**Table 1. 1997 Average temperature and rainfall at Lexington and Princeton.**

MONTH	Lexington				Princeton			
	Avg Temp		Rainfall		Avg Temp		Rainfall	
	°F	DEP	IN	DEP	°F	DEP	IN	DEP
JAN	31	+0	2.94	0.08	35	1	2.74	-1.06
FEB	41	6	2.62	-0.59	44	6	3.83	-0.6
MAR	46	2	13.06	8.66	52	5	13.1	8.17
APR	49	-6	1.4	-2.48	54	-5	3.94	-0.86
MAY	58	-6	6.14	1.67	63	-4	5.36	0.4
JUN	70	-2	6.2	2.54	74	-1	5.09	1.24
JUL	75	-1	3.32	-1.68	79	1	1.9	-2.39
AUG	72	-3	3.02	-0.91	77	0	2.06	-1.95
SEP	66	-2	1.47	-1.73	71	0	3.89	0.56
OCT	56	-1	1.92	-0.65	68	9	0.88	-2.17

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

**Table 2. Dry matter yields (tons/acre) for tall fescue and perennial ryegrass (PRG) varieties sown 6 September 1995 at Lexington, Kentucky.**

Variety	1996 Total	1997 Harvests			1997 Total	2-yr Total
		May 22	Jul 2	Nov 12		
<b>Commercial Varieties - Available for Farm Use</b>						
BISON (PRG)	4.99 *	1.17	1.95 *	0.52	3.64	8.63 *
CATTLE-CLUB	4.15	1.58 *	1.51	1.00 *	4.10 *	8.25 *
FESTORINA	4.2	1.33	1.51	1.11 *	3.95 *	8.14 *
FUEGO	3.51	1.61 *	1.44	1.07 *	4.12 *	7.63
<b>Experimental Varieties - Not Available for Farm Use</b>						
FA89K	4.48	1.56 *	1.5	1.27 *	4.33 *	8.81 *
KY31+	4.52 *	1.53 *	1.49	1.17 *	4.19 *	8.71 *
GA156	3.99	1.59 *	1.64 *	1.15 *	4.38 *	8.37 *
FTF9077	4.27	1.58 *	1.32	1.12 *	4.02 *	8.30 *
GA153	4.07	1.3	1.57 *	1.19 *	4.06 *	8.13 *
KY31-	4.16	1.50 *	1.34	1.04 *	3.88 *	8.04 *
WVPB-PER-90-1 (PRG)	3.23	1.40 *	0.69	0.54	2.63	5.86
MEAN	4.14	1.47	1.45	1.01	3.94	8.08
CV,%	7.9	13.1	20.7	21.2	13.0	8.9
LSD, 0.05	0.28	0.17	0.26	0.19	0.45	0.63

*\* Varieties with an asterisk are not significantly different from the top ranked variety in the top column, based on the 0.05 LSD.*

**Table 3. Dry matter yields (tons/acre) of tall fescue and bluegrass (BG) varieties sown 23 August 1996 at Lexington, Kentucky.**

Variety	1997 Harvests				1997 Total
	May 20	Jul 9	Aug 19	Nov 12	
<b>Commercial Varieties - Available for Farm Use</b>					
STARGRAZER	2.43 *	3.63 *	1.00 *	1.22 *	8.28 *
KY31+	2.50 *	3.34	0.87	1.03	7.74
BARCEL	1.97	3.24	0.81	1.00	7.02
FESTORINA	1.98	3.05	0.86	1.11	7.00
DOVEY	1.30	3.23	1.16 *	1.30 *	6.99
LATO (BG)	1.90	2.2	0.41	0.82	5.33
KENBLUE (BG)	1.36	1.62	0.40	0.43	3.81
<b>Experimental Varieties - Not Available for Farm Use</b>					
TF9201	2.51 *	3.83 *	1.13 *	1.34 *	8.81 *
KY31-	2.51 *	3.70 *	0.98 *	1.18 *	8.37 *
KYTF2	2.76 *	3.71 *	0.76	1.04	8.26 *
KYFA9403	2.50 *	3.71 *	0.91	1.02	8.14 *
KYFA9304	2.44 *	3.39	0.86	1.08	7.77
KYFA9303	2.43	3.29	0.9	1.03	7.65
BARFA4113	2.15	3.39	0.85	1.06	7.45
KYFA9301	2.28	3.37	0.89	0.9	7.45
KYFA9302	2.07	3.43 *	0.83	1.07	7.4
FA-89K	2.29	3.19	0.85	1.07	7.39
TF9005	2.13	3.18	0.92	1.00	7.23
GA156	1.69	3.29	1.09 *	1.11 *	7.19
KYFA9404	1.93	3.22	1.01 *	0.96	7.13
BAR-FA-6FRD	1.87	3.23	0.87	1.10	7.07
BARFA2HG	2.08	3.05	0.68	0.96	6.77
GA153	1.23	2.90	0.82	0.94	5.89
MEAN	2.10	3.23	0.86	1.03	7.22
CV,%	15.40	9.20	17.63	16.10	9.67
LSD, 0.05	0.46	0.42	0.22	0.24	1.00

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

**Table 4. Dry matter yields (tons/acre) and ratings for stand and maturity of tall fescue and varieties and chicory sown 20 August 1996 at Princeton, Kentucky.**

Variety	Stand Rating <sup>1</sup> Mar 27	Maturity <sup>2</sup> May 11	1997 Harvests					1997 Total
			May 13	Jun 24	Aug 7	Sep 18	Nov 25	
<b>Commercial Varieties - Available for Farm Use</b>								
PUNA (Chicory)	4.75	100 *	1.97 *	2.08 *	1.33 *	1.15 *	0.38	6.92 *
STARGRAZER	6.75 *	52.00	1.87	1.34	1.44 *	1.04 *	0.71 *	6.39 *
STAG	6.50 *	58.50	1.86	1.47	1.33 *	0.79	0.56	6.01 *
ORYGUN	6.75 *	51.75	2.28 *	1.64 *	0.57	0.62	0.63 *	5.74
KY31+	6.25	54.75	1.96 *	1.53	0.69	0.48	0.76 *	5.42
FESTORINA	6.25	50.25	1.69	1.39	0.78	0.59	0.73 *	5.17
<b>Experimental Varieties - Not Available for Farm Use</b>								
KYFA9302	6.50	55.75	1.82	1.7 *	1.09 *	0.72	0.76 *	6.10 *
KYFA9403	7.25 *	51.25	1.98 *	1.54	1.14 *	0.74	0.61 *	6.02 *
TF8503	5.25	54.50	1.84	1.58 *	1.03 *	0.74	0.69 *	5.88
KYFA9304	7.25 *	51.75	1.92 *	1.73 *	0.97 *	0.61	0.64 *	5.87
OFIB-1	6.25	56.25	1.78	1.39	1.15 *	0.82 *	0.69 *	5.83
KYFA9402	7.25 *	54.25	1.83	1.62 *	1.10 *	0.70	0.57	5.81
KYFA9303	6.75 *	53.25	1.78	1.73 *	0.93 *	0.58	0.66 *	5.69
KY31-	6.75 *	51.75	1.77	1.77 *	0.84	0.50	0.76 *	5.63
KYTF2	7.50 *	49.25	2.07 *	1.66 *	0.74	0.60	0.50	5.57
EA30	6.25	58.50	1.83	1.58	0.84	0.53	0.74 *	5.52
KYFA9301	6.50	51.25	1.93 *	1.65 *	0.76	0.56	0.60	5.50
KYFA9401	7.25 *	51.25	1.87	1.77 *	0.74	0.49	0.64 *	5.50
BAR-FA-6FRD	5.25	46.00	1.32	1.71 *	0.73	0.53	0.59	4.88
EA70	4.25	47.00	1.02	1.30	0.78	0.62	0.94 *	4.67
TF9005	3.25	53.50	1.14	1.34	0.96 *	0.58	0.48	4.50
MEAN	6.23	54.89	1.79	1.60	0.95	0.67	0.65	5.65
CV, %	11.38	3.08	15.48	22.00	39.71	37.35	36.72	11.89
LSD, 0.05	1.00	2.39	0.39	0.50	0.53	0.35	0.34	0.95

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

<sup>1</sup> Stand rating: 0=bare 9=densest stand.

<sup>2</sup> 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 93=final stage of seed development.

Table 5. Performance of tall fescue, bluegrass (BG), and perennial ryegrass (PRG) varieties and chicory across years and locations.			Lexington			Princeton
			1995 <sup>1</sup>		1996	1996
Variety	Proprietor/KY Distributor	EI <sup>3</sup>	96 <sup>2</sup>	97	97	97
<b>Commercial Varieties - Available for Farm Use</b>						
Barcel	Barenbrug Research/Barenbrug USA	free				
Cattle Club	Green Seed	free	*	*		
Dovey						
Festorina	Advanta Seeds West/Oldfields Seeds	free	*	*		
Fuego	Advanta Seeds West/Oldfields Seeds	free		*		
Kenblue (BG)						
KY31IN	KY Agric. Exp. Sta./Public	high	*	*		
Lato (BG)						
Orygun	Turner Seeds					
Puna Chicory	Burlingham Seeds					*
Stag	Cascade International					*
Stargrazer	FFR/Southern States	low			*	*
Bison (PRG)	International Seeds	low	*			
<b>Experimental Varieties - Not Available for Farm Use</b>						
BAR FA 2HG	Barenbrug Research/Experimental	free				
BAR FA 4113	Barenbrug Research/Experimental	free				
BAR FA 6FRD	Barenbrug Research/Experimental					
EA30	Cascade International					
EA70	Cascade International					
FA89K	Barenbrug Research/Experimental	free	*	*		
FTF9077	International Seeds	free	*	*		
GA153	GA Agric. Exp. Sta./Experimental	free	*	*		
GA156	GA Agric. Exp. Sta./Experimental	free	*	*		
KY31CL	KY Agric. Exp. Sta./Experimental	free		*	*	
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	free			*	
OFI B-1						
TF8503	Royal Seeds West					
TF9005	Barenbrug Research/Experimental					
TF9201					*	
WVPB-PER-90-1 (PRG)	Willamette Valley Plant Breeders/Experimental	low				

<sup>1</sup> Establishment year  
<sup>2</sup> Harvest year  
<sup>3</sup> Endophyte Infection Level  
\* 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.

