

# 2003 Tall Fescue Report

*R.F. Spitaleri, M. Collins, T.D. Phillips, G.D. Lacefield, and D.C. Ditsch*

## 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 or infected with an endophyte that is apparently non-toxic.

This report provides current yield data on tall fescue varieties and other selected species 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. For the new "friendly endophyte" tall fescues, the seed tag should specify the infection level. Also, seed of these varieties should be handled carefully to preserve this infection, which means keeping seed cool and planting as soon as possible.

**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 (2001), Quicksand (2001), and Princeton (2002). The soils at Lexington (Maury), Quicksand (Pope), 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 by 15 feet in a randomized complete block design with four replications. Nitrogen was topdressed at 60 lb/A of actual N in March 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 2003 for Lexington, Quicksand, and Princeton are presented in Table 1. After a wet spring, Kentucky experienced the fourth driest and hottest summer on record. This adversely affected the number of harvests and total seasonal yield.

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.

Statistical analyses were performed on all data 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.

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 experi-

mental 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 through 4).

## Summary

Selecting a good 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 Quicksand, Lexington, and Princeton in 2003.**

	Quicksand				Lexington				Princeton			
	Temp		Rainfall		Temp		Rainfall		Temp		Rainfall	
	°F	DEP	IN	DEP	°F	DEP	IN	DEP	°F	DEP	IN	DEP
JAN	29	-2	1.89	-1.4	26	-5	0.96	-1.90	31	-3	2.19	-1.61
FEB	34	+1	7.90	+4.3	32	-3	3.59	+0.38	35	-3	7.45	+3.02
MAR	51	+10	1.44	-2.9	47	+3	2.09	-2.31	50	+3	2.46	-2.48
APR	59	+6	5.15	+1.05	57	+2	3.14	-0.74	60	+1	6.99	+2.19
MAY	63	+1	5.49	+1.01	63	-1	6.68	+2.21	67	0	4.81	-0.15
JUN	68	-2	7.53	+3.71	69	-3	4.85	+1.19	71	-4	5.05	+1.20
JUL	74	0	3.45	-1.80	74	-2	2.68	-2.32	79	+1	4.75	+0.46
AUG	75	+2	5.08	+1.07	75	0	5.26	+1.33	79	+2	2.05	-1.96
SEP	66	0	4.26	+0.74	65	-3	4.22	+1.02	69	-2	6.17	+2.84
OCT	58	+4	2.33	-0.58	56	-1	1.61	-0.96	60	+1	3.73	+0.68
NOV	52	+10	5.47	+1.59	50	+5	4.63	+1.24	53	+6	5.85	+1.22
<b>Total</b>			<b>49.99</b>	<b>+6.79</b>			<b>39.71</b>	<b>-0.86</b>			<b>51.50</b>	<b>+5.41</b>

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

**Table 2. Dry matter yields (tons/acre) of tall fescue, prairie brome (PB, *Bromus willdenoii*), and festulolium (FL) varieties sown September 7, 2001, at Lexington, Kentucky.**

Variety	Vigor <sup>1</sup> Nov 2, 2001	Total 2002	Maturity <sup>2</sup> May 12, 2003	2003 harvests				Total 2003	2-yr Total
				May 12	Jun 24	Sep 15	Oct 13		
<b>Commercial Varieties—Available for Farm Use</b>									
Ky 31+ <sup>3</sup>	5	5.52	56	2.50	1.35	1.19	0.48	5.52	11.04*
Tuscany	3	5.67	58	2.25	1.11	1.04	0.47	4.87	10.54*
Select	4	5.48	57	2.28	1.24	0.83	0.39	4.75	10.23*
Johnstone	5	4.95	56	2.45	1.27	1.10	0.43	5.25	10.19*
Festival	4	5.38	58	2.13	1.32	0.87	0.38	4.70	10.08*
Atom (PB)	5	5.50	61	1.94	1.32	0.68	0.30	4.24	9.74*
Felina (FL)	4	5.04	56	2.08	1.38	0.85	0.30	4.61	9.66*
Hoedown	3	5.01	59	2.24	1.14	0.83	0.44	4.64	9.65*
Carmine	4	5.09	57	1.97	1.25	0.74	0.41	4.38	9.47
Maximize	4	4.87	56	1.94	1.14	0.85	0.50	4.43	9.30
Lakota	5	4.68	58	1.92	1.23	0.83	0.38	4.36	9.04
SpringGreen (FL)	5	4.91	49	2.42	1.06	0.29	0.17	3.95	8.86
Kokanee	4	4.40	41	2.04	1.27	0.74	0.28	4.33	8.73
Resolute	4	3.75	51	2.32	1.12	0.91	0.40	4.74	8.50
Dixon	5	3.53	57	2.05	1.23	0.79	0.39	4.46	7.99
<b>Experimental Varieties</b>									
KY 31- <sup>3</sup>	4	5.83	57	2.53	1.31	0.91	0.38	5.14	10.97*
KYFA 9304	4	5.77	57	2.39	1.42	0.97	0.40	5.19	10.96*
FABE 9301	2	4.88	55	2.28	1.29	1.18	0.50	5.25	10.13*
BARFA 1004	4	5.03	58	2.10	1.36	0.95	0.58	4.99	10.02*
BTR 12	4	4.93	57	2.15	1.24	1.05	0.44	4.88	9.81*
TF9503	3	5.14	56	2.12	1.18	0.89	0.41	4.59	9.74*
KYFA 9301	5	4.91	57	1.97	1.20	0.96	0.44	4.57	9.48
BTR 11	4	4.79	52	1.89	1.19	1.02	0.50	4.60	9.40
K 5666V	3	4.31	51	1.76	1.06	0.70	0.40	3.92	8.23
PP 10	3	4.16	56	1.84	1.01	0.52	0.35	3.73	7.88
Mean	3.98	4.94	55.33	2.14	1.23	0.87	0.41	4.64	9.58
CV, %	16.90	12.18	8.31	12.18	15.29	22.52	19.08	10.88	10.76
LSD, 0.05	0.95	0.85	6.49	0.37	0.27	0.28	0.11	0.71	1.45

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

<sup>1</sup> Vigor score based on a scale of 1 to 5 with 5 being the most vigorous seedling growth.

<sup>2</sup> Maturity rating scale: 37=flag leaf emergence, 45=boot swollen, 50=beginning of inflorescence emergence, 58=complete emergence of inflorescence, 62=beginning of pollen shedding.

<sup>3</sup> "+" 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 September 18, 2001, at Quicksand, Kentucky.**

Variety	Total 2002	Maturity <sup>1</sup> May 30, 2003	2003 Harvests			Total 2003	2-yr Total
			May 30	Jun 3	Oct 6		
<b>Commercial Varieties—Available for Farm Use</b>							
Ky 31+ <sup>2</sup>	6.24	65	2.52	1.22	1.15	4.89	11.13*
Select	6.40	71	1.80	0.93	0.85	3.58	9.98*
Festival	5.67	70	2.08	0.92	0.87	3.87	9.54*
Hoedown	5.48	70	2.18	0.92	0.88	3.98	9.46
Carmine	5.03	67	2.05	0.95	0.67	3.66	8.69
SpringGreen (FL)	5.07	64	2.58	0.67	0.35	3.61	8.68
Maximize	4.87	69	1.80	0.91	0.70	3.41	8.29
Resolute	2.95	71	1.51	0.57	0.78	2.86	5.81
<b>Experimental Varieties</b>							
FA 9304	6.49	69	2.31	1.16	0.95	4.41	10.90*
TF 9503	6.29	69	2.29	1.24	0.94	4.47	10.76*
HM 4- NE <sup>2</sup>	6.01	70	2.37	1.06	1.01	4.44	10.45*
KY 31- <sup>2</sup>	5.59	68	2.07	0.94	0.77	3.78	9.37
FA 9301	5.50	68	1.97	0.96	0.92	3.85	9.35
BARFA 1004	5.39	72	1.84	0.92	0.80	3.56	8.94
Mean	5.50	68.59	2.10	0.96	1.55	3.88	9.38
CV, %	11.99	4.05	22.02	22.88	20.26	16.81	12.02
LSD, 0.05	0.94	3.97	0.66	0.31	0.24	0.93	1.61

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

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

<sup>2</sup> "+" indicates variety is endophyte infected; "-" indicates variety is endophyte free; NE indicates variety is infected with novel or friendly endophyte.

**Table 4. Dry matter yields (tons/acre) of tall fescue varieties sown September 25, 2002, at Princeton, Kentucky.**

Variety	Vigor <sup>1</sup> Oct 22, 2002	Maturity <sup>2</sup> May 15, 2003	2003 Harvests				Total 2003
			May 15	Jun 18	Jul 29	Sep 24	
<b>Commercial Varieties—Available for Farm Use</b>							
Ky 31+ <sup>3</sup>	5	33	2.26	1.36	0.78	0.62	5.03*
Bull	3	64	2.24	1.34	0.69	0.59	4.86*
Max Q	3	62.75	2.16	1.35	0.68	0.52	4.7*
Select	4	51.75	2.08	1.27	0.69	0.51	4.56*
<b>Experimental Varieties</b>							
KYFA 9301	5	30.5	2.36	1.32	0.66	0.58	4.91*
RAD-MA 216	5	45.5	2.49	1.35	0.55	0.48	4.88*
HM	2	52.25	2.33	1.19	0.6	0.61	4.73*
Ky 31- <sup>3</sup>	5	43.25	2.38	1.16	0.6	0.59	4.72*
KYFA 9304	5	28.75	2.19	1.34	0.66	0.5	4.69*
Fabe 9301a	5	44.75	2.29	1.09	0.52	0.55	4.45*
PBR	2	35.75	1.77	0.94	0.32	0.32	3.35
EC 409	3	29	1.76	1.1	0.28	0.2	3.34
Mean	3.79	43.44	2.19	1.23	0.59	0.51	4.52
CV, %	10.85	22.78	11.67	12.81	14.76	13.40	9.15
LSD, 0.05	0.59	14.23	0.37	0.23	0.12	0.10	0.60

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

<sup>1</sup> Vigor score based on a scale of 1 to 5 with 5 being the most vigorous seedling growth.

<sup>2</sup> Maturity rating scale: 37=flag leaf emergence, 45=boot swollen, 50=beginning of inflorescence emergence, 58=complete emergence of inflorescence, 62=beginning of pollen shedding.

<sup>3</sup> "+" indicates variety is endophyte infected; "-" indicates variety is endophyte free.

**Table 5. Performance of tall fescue, festulolium (FL), and prairie brome (PB) varieties across years and locations.**

		Lexington		Quicksand		Princeton
		2001 <sup>1</sup>		2001		2002
Variety	Proprietor/KY Distributor	02 <sup>2</sup>	03	02	03	03
<b>Commercial Varieties—Available for Farm Use</b>						
Atom (PB)	Forage Genetics International	*				
Bull	Improved Forages					*
Carmine	DLF — Jenks	*				
Dixon (PB)	Ampac Seed Company					
Felina (FL)	DLF — Jenks	*				
Festival	Pickseed West Inc.	*		*	*	
Hoedown	DLF — Jenks	*				
Johnstone	Proseeds		*			
Kokanee	Ampac Seed Company					
Ky 31+ <sup>3</sup>	KY Agric. Exp. Sta./Public	*	*	*	*	*
Lakota (PB)	Ampac Seed Company					
Maximize	Turf-Seed, Inc.					
Jesup Max Q	Pennington Seed					*
Resolute	Ampac Seed Company					
Select	FFR Cooperative	*		*	*	*
Spring Green (FL)	Turf-Seed, Inc.					
Tuscany II	Forage Genetics International	*	*			
<b>Experimental Varieties</b>						
BAR FA 1004	Barenbrug USA	*	*			
BTR 11	Barenbrug USA					
BTR 12	Barenbrug USA		*			
EC 409	Emerald Commodities, Inc.					
FA BE 9301	Barenbrug USA		*			*
HM	FFR Cooperative					*
HM4	FFR Cooperative			*	*	
K 5666V	Ampac Seed Company					
Ky 31- <sup>3</sup>	KY Agric. Exp. Sta./Experimental	*	*	*		*
KYFA 9301	KY Agric. Exp. Sta./Experimental					*
KYFA 9304	KY Agric. Exp. Sta./Experimental	*	*	*	*	*
PBR	Barenbrug USA					
PP 10	Ampac Seed Company					
RAD MA 216	Lewis Seed Co.					*
TF 9503	Allied Seed L.L.C.	*		*	*	

\* 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.  
<sup>1</sup> Establishment year.  
<sup>2</sup> Harvest year.  
<sup>3</sup> "+" indicates variety is endophyte infected, "-" indicates variety is endophyte-free.

*Mention or display of a trademark, proprietary product, or firm in text or figures does not constitute an endorsement and does not imply approval to the exclusion of other suitable products or firms.*

