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2005 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 or infected with a non-toxic endophyte. Varieties in the latter group are also referred to as "novel" or "friendly" endophyte varieties.

This report provides current yield data on tall fescue varieties and similar grass species in trials in Kentucky as well as guidelines for selecting tall fescue varieties. Go to the UK Forage Extension Web site at www.uky.edu/AG/FORAGE to obtain electronic versions of all forage variety testing reports as well as other forage publications.

Important Selection Considerations

Local Adaptation and Seasonal Yield. Before purchasing tall fescue seed, make sure that the variety is 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 persistent varieties and 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 leaf diseases such as helminthsporium 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 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. Seed with infection levels of less than 5% is regarded as being endophyte free. A statement to that effect will be displayed prominently 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. With the new "novel 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 levels and free from weed seed. Buy certified seed of improved varieties. An improved variety is one that has performed well in independent trials. The label also includes 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 four studies is reported. Tall fescue varieties were sown at Lexington (2003), Quicksand (2003), and Princeton (2002 and 2004). 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, after the first cutting, and again in late summer, for a total of 180 lb/A over the season. 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 Lexington, Quicksand, and Princeton are presented in Tables 1 through 3.

Ratings for maturity, stand, and dry matter yields (tons/acre) are reported in Tables 4 through 7. 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 and 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 8 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 8, an open block indicates that the variety was not in that particular test (labeled at the top of the column), while an (x) in the block means that the variety was in the test but yielded significantly less than the top-yielding variety. 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 4 through 7).

Table 1. Temperature and rainfall at Princeton, Kentucky in 2003, 2004 and 2005.

	2003				2004				2005			
	Temperature		Rainfall		Temperature		Rainfall		Temperature		Rainfall	
	°F	DEP	IN	DEP	°F	DEP	IN	DEP	°F	DEP	IN	DEP
JAN	31	-3	2.19	-1.61	36	+2	4.12	+0.32	41	+7	5.30	+1.50
FEB	35	-3	7.45	+3.02	39	+1	2.44	-1.99	43	+5	2.30	-2.13
MAR	50	+3	2.46	-2.48	53	+6	4.28	-0.66	47	0	4.11	-0.83
APR	60	+1	6.99	+2.19	59	0	5.32	+0.52	60	+1	4.61	-0.19
MAY	67	0	4.81	-0.15	72	+5	7.34	+2.38	65	-2	1.54	-3.42
JUN	71	-4	5.05	+1.20	74	-1	3.40	-0.45	76	+1	3.09	-0.76
JUL	79	+1	4.75	+0.46	75	-3	4.87	+0.58	79	+1	2.39	-1.90
AUG	79	+2	2.05	-1.96	73	-4	3.02	-0.99	80	+3	11.54	+7.53
SEP	69	-2	6.17	+2.84	71	0	0.20	-3.13	74	+2	2.17	-1.16
OCT	60	+1	3.73	+0.68	64	+5	4.03	+0.98	60	+1	0.19	-2.86
NOV	53	+6	5.85	+1.22	53	+6	6.94	+2.31	50	+3	2.48	-2.15
DEC	40	+1	2.39	-2.65	37	-1	4.29	-0.75				
Total		.	53.89	+2.76			50.25	-0.88			39.72	-6.37

DEP is departure from the long-term average.

Table 2. Temperature and rainfall at Lexington, Kentucky in 2004 and 2005.

	2004				2005			
	Temperature		Rainfall		Temperature		Rainfall	
	°F	DEP	IN	DEP	°F	DEP	IN	DEP
JAN	30	-1	3.14	+0.28	37	+6	4.35	+1.49
FEB	36	+1	1.32	-1.89	39	+4	1.68	-1.53
MAR	47	+3	3.43	-0.97	41	-3	2.79	-1.61
APR	55	0	3.06	-0.82	56	+1	3.30	-0.58
MAY	68	+4	9.79	+5.32	61	-3	1.78	-2.69
JUN	72	0	3.13	-0.53	75	+3	1.33	-2.33
JUL	73	-3	7.65	+2.65	77	+1	3.30	-1.70
AUG	71	-4	2.91	-1.02	78	+3	3.34	-0.59
SEP	68	0	2.61	-0.59	72	+4	0.59	-2.21
OCT	58	+1	5.65	+3.08	58	+1	0.92	-1.65
NOV	49	+4	6.29	+2.90	47	+2	1.54	-1.85
DEC	36	0	3.20	-0.78				
Total			52.18	+7.63			25.32	-15.25

DEP is departure from the long-term average.

Table 3. Temperature and rainfall at Quicksand, Kentucky in 2004 and 2005.

	2004				2005			
	Temperature		Rainfall		Temperature		Rainfall	
	°F	DEP	IN	DEP	°F	DEP	IN	DEP
JAN	34	+3	4.48	+1.19	40	+9	4.45	+1.16
FEB	39	+6	3.45	-0.15	42	+9	3.01	-0.59
MAR	49	+8	3.84	-0.5	44	+3	2.86	-1.48
APR	51	+4	4.84	+0.74	58	+5	6.63	+2.53
MAY	68	+6	11.22	+6.74	63	+1	2.05	-2.43
JUN	71	+1	6.19	+2.37	75	+5	2.39	-1.43
JUL	75	+1	2.3	-2.95	78	+4	2.58	-2.67
AUG	72	-1	1.37	-2.64	79	+6	3.51	-0.50
SEP	69	+3	6.8	+3.28	72	+6	0.27	-3.25
OCT	61	+7	4.19	+1.29	59	+5	0.68	-2.23
NOV	51	+9	3.56	-0.32	49	+7	1.30	-2.58
DEC	37	+4	3.59	-0.55				
Total			55.83	+8.49			29.73	-13.47

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

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.

The following is a list of University of Kentucky Cooperative Extension publications related to tall fescue management available from your county Extension office:

- AGR-1 Lime and Fertilizer Recommendations
- AGR-18 Grain and Forage Crop Guide for Kentucky
- AGR-59 Tall Fescue
- AGR-64 Establishing Forage Crops
- AGR-108 Tall Fescue in Kentucky

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

Variety	Maturity[1] May 10, 2005	2005 Percent Stand Apr 15	2005 Percent Stand Nov 3	Yield (tons/acre) 2003 Total	2004 Total	2005 May 10	2005 Jun 13	2005 Jul 29	2005 Oct 6	2005 Total	3-yr Total
Commercial Varieties—Available for Farm Use											
KY31+[2]	54.0	83	95	5.03	3.76	1.42	0.66	0.25	1.23	3.57	12.36*
Bull	57.5	88	95	4.86	3.92	1.29	0.70	0.28	1.13	3.39	12.16*
Jesup MaxQ	55.5	79	95	4.70	3.18	1.42	0.76	0.28	1.30	3.76	11.64*
Select	55.0	88	95	4.56	3.58	1.04	0.48	0.35	1.21	3.09	11.22*
Experimental Varieties											
RAD-MA216	56.5	85	70	4.88	3.96	1.29	0.66	0.29	1.18	3.41	12.25*
FABE9301a	46.3	84	90	4.45	4.03	1.48	0.40	0.31	1.15	3.33	11.82*
KY31-[2]	56.0	86	95	4.72	3.85	0.96	0.51	0.30	1.36	3.13	11.70*
KYFA9301	56.0	83	95	4.91	3.04	1.61	0.62	0.28	1.20	3.71	11.66*
KYFA9304	54.5	79	95	4.69	3.43	0.97	0.54	0.30	1.07	2.87	11.00*
PBR	55.0	43	40	3.35	3.64	0.42	0.50	0.24	0.82	1.99	8.97
EC409	56.0	16	18	3.34	3.39	0.73	0.54	0.23	0.72	2.23	8.95
Mean	54.9	74.4	81.5	4.52	3.63	1.15	0.58	0.29	1.13	3.15	11.30
CV,%	2.5	9.3	16.9	9.14	17.93	38.99	35.04	30.33	19.54	19.52	9.84
LSD,0.05	1.9	10.0	19.8	0.59	0.94	0.65	0.29	0.13	0.32	0.89	1.60

*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 emergence, 58=complete emergence of inflorescence, 62=beginning of pollen shedding.

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

Table 5. Dry matter yields (tons/acre), seedling vigor, maturity and stand rating of tall fescue, festulolium (FL) and Kentucky bluegrass (BG) sown September 16, 2003 at Lexington, Kentucky.

Variety	Seedling Vigor[1] Oct. 31 2003	Maturity[2] May 13, 2005	2005 Percent Stand		Yield (tons/acre)						
					2004	2005					2-yr
			Apr 8	Oct 31	Total	May 13	Jun 24	Aug 18	Oct 26	Total	Total
Commercial Varieties—Available for Farm Use											
KY31+[3]	4.8	54.0	98	94	7.04	2.95	1.23	0.42	0.59	5.19	12.23*
Stockman	4.0	56.0	98	93	7.66	2.69	1.02	0.10	0.26	4.07	11.73*
Bull	4.3	58.0	100	94	6.28	2.76	0.91	0.30	0.41	4.37	10.66
Hykor (FL)[4]	4.3	56.5	100	81	6.90	2.36	1.06	0.13	0.19	3.73	10.64
Select	3.3	55.5	96	78	6.35	2.77	0.63	0.15	0.29	3.84	10.18
Barianne	3.8	45.0	99	94	5.57	2.17	1.00	0.30	0.38	3.84	9.41
Slezanka (BG)[4]	2.3	55.5	95	95	3.03	1.97	0.62	0.19	0.47	3.25	6.27
Ginger (BG)[4]	2.0	66.0	83	48	3.20	1.40	0.16	0.08	0.15	1.78	4.98
Experimental Varieties											
CIS-FTF25	4.5	56.5	98	95	6.95	2.57	1.14	0.28	0.42	4.41	11.36*
KYFA0006	4.3	50.5	98	91	6.89	2.86	1.07	0.18	0.27	4.38	11.27*
KYTF2	4.0	51.5	98	75	7.18	2.61	0.86	0.14	0.24	3.85	11.02*
KYFA9304	4.0	54.0	98	95	6.85	2.69	0.94	0.18	0.29	4.10	10.95*
KY31-[3]	4.5	55.5	100	96	6.94	2.52	1.03	0.11	0.30	3.96	10.90*
ERF38	4.0	56.5	99	90	6.20	2.68	0.84	0.20	0.30	4.01	10.21
CIS-FTF24	4.5	58.0	100	91	5.57	2.74	0.88	0.44	0.46	4.52	10.09
MRF42	4.0	54.5	98	95	6.36	2.30	0.75	0.18	0.26	3.49	9.85
KYFA9611	3.0	46.3	95	74	6.74	1.77	0.83	0.12	0.17	2.88	9.62
KYFA9602	3.3	52.5	95	63	6.08	2.30	0.74	0.10	0.21	3.35	9.43
KYFA9819 (FL)[4]	5.0	46.3	88	86	5.26	2.20	0.64	0.05	0.02	3.05	8.31
KYPP9901 (BG)[4]	2.5	64.5	99	100	2.26	2.56	0.38	0.07	0.32	3.33	5.58
HB95 (BG)[4]	1.0	61.0	15	34	0.04	0.31	0.25	0.17	0.16	0.89	0.93
HB96 (BG)[4]	1.0	66.0	0	20	0.08	0.17	0.13	0.07	0.12	0.48	0.56
Mean	3.6	52.3	88.9	81.6	5.49	2.27	0.78	0.18	0.30	3.52	9.01
CV,%	11.2	2.9	9.4	20.9	12.89	19.52	27.97	63.01	36.84	17.85	11.86
LSD,0.05	0.6	2.4	11.8	24.0	1.00	0.62	0.31	0.16	0.15	0.89	1.51

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

[1] Vigor score based on scale of 1 to 5 with 5 being the most vigorous seedling growth.

[2] 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.

[3] "+" indicates variety is endophyte infected; "-" indicates variety is endophyte free.

[4] FL=festulolium; BG=Kentucky bluegrass

Table 6. Dry matter yields (tons/acre), maturity and stand rating of tall fescue and festulolium varieties sown October 9, 2003 at Quicksand, Kentucky.

Variety	Maturity[1] May 11, 2005	2005 Percent Stand		Yield (tons/acre)					
				2004	2005				2-yr
		Apr 14	Nov 28	Total	May 11	Jun 29	Aug 22	Total	Total
Commercial Varieties—Available for Farm Use									
Stockman	62	88	85	7.10	2.84	1.19	0.99	5.02	12.13*
Select	62	93	91	6.54	2.69	1.44	1.09	5.22	11.75*
Jesup MaxQ	62	93	93	6.83	2.62	1.09	1.01	4.72	11.55*
Hykor (FL)	62	90	80	6.08	2.92	1.42	0.95	5.29	11.37*
KY 31+	62	90	89	6.88	2.14	1.31	1.03	4.47	11.35*
Bull	62	95	91	6.38	2.85	1.08	0.93	4.85	11.23
Experimental Varieties									
KYTF 2	62	86	76	7.18	2.88	1.48	0.91	5.27	12.46*
KYFA 9304	62	90	89	6.83	2.54	1.50	1.11	5.15	11.98*
KYFA 9602	62	85	84	7.44	2.42	1.20	0.91	4.54	11.98*
Mean	62	89.9	86.6	6.81	2.64	1.28	0.98	4.91	11.72
CV,%	0	5.5	8.4	7.78	18.10	17.19	20.23	12.36	6.62
LSD,0.05	0	7.1	10.6	0.77	0.69	0.32	0.29	0.88	1.13

*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 emergence, 58=complete emergence of inflorescence, 62=beginning of pollen shed.

Table 7. Dry matter yields (tons/acre), seedling vigor, maturity and stand rating of tall fescue varieties sown September 1, 2004 at Princeton, Kentucky.

Variety	Seedling Vigor[1] Dec 21, 2004	Maturity[2] May 10, 2005	2005 Percent Stand		2005 Yield (tons/acre)				
			Apr 15	Nov 3	May 10	Jun 13	Jul 29	Oct 5	Total
Commercial Varieties—Available for Farm Use									
Select	3.8	55.5	100	96	3.51	0.75	0.75	1.56	6.57*
Enhance	2.5	51.5	98	96	1.86	1.18	0.95	1.91	5.89*
KY31+[3]	3.0	52.0	98	98	2.55	0.77	0.87	1.49	5.68*
Stockman	3.3	55.5	94	96	1.92	0.95	1.00	1.70	5.58*
Festival	3.5	53.5	93	98	1.86	0.98	0.98	1.50	5.32
KENHY	4.0	53.0	100	99	2.42	0.67	0.86	1.21	5.16
Seine	2.8	53.5	96	99	1.76	0.84	0.86	1.48	4.94
Experimental Varieties									
KYFA9304	4.0	55.5	98	100	3.03	1.06	0.86	1.53	6.47*
KYFA9905	5.0	51.0	100	100	2.66	1.08	0.81	1.49	6.05*
KYFA9611	3.3	46.3	96	98	2.35	0.99	1.04	1.67	6.04*
KYTF-2	3.0	52.8	96	100	2.19	1.08	0.94	1.70	5.91*
KYFA9811	5.0	52.0	99	100	2.39	1.03	0.77	1.55	5.75*
PST-5NF	3.3	54.5	76	100	2.13	0.99	0.99	1.60	5.71*
KYFA9901	4.3	49.8	98	99	1.62	1.18	0.92	1.58	5.30
KYFA9602	3.5	49.3	84	80	3.15	1.13	0.09	0.90	5.27
ARGL	4.5	56.0	99	98	1.68	1.07	0.85	1.64	5.23
CSN2G	3.5	53.8	98	99	2.01	0.84	0.79	1.58	5.22
KY31-[3]	3.3	51.0	98	94	1.76	0.99	0.83	1.63	5.20
KYFA9917	3.5	49.3	98	99	1.08	0.90	0.95	1.43	4.35
Mean	3.6	52.4	95.5	97.2	2.71	0.97	0.85	1.53	5.56
CV,%	16.9	5.7	11.3	5.9	31.20	20.42	12.21	15.16	13.77
LSD,0.05	0.9	4.2	15.3	8.2	0.98	0.28	0.15	0.33	1.09

*Not significantly different from the highest numerical value in the column, based on the 0.05 LSD.
[1] Vigor score based on scale of 1 to 5 with 5 being the most vigorous seedling growth
[2] 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.
[3] "+" indicates variety is endophyte infected; "-" indicates variety is endophyte free.

Table 8. Performance of tall fescue and festulolium (FL) varieties across years and location.									
		Lexington 2003[1]		Quicksand 2003		Princeton			
						2002			2004
Variety	Proprietor/KY Distributor	04[2]	05	04	05	03	04	05	05
Commercial Varieties—Available for Farm Use									
Barianne	Barenbrug USA	x	x						
Bull	Improved Forages	x	*	x	x	*	*	*	
Enhance	Allied Seed								*
Festival	Pickseed West, Inc.								x
Hykor (FL)	DLF International Seed	*	x	x	*				
KENHY									x
KY31+[3]	Ky Agric. Exp. Station/Public	*	*	*	*	*	*	*	*
Jesup MaxQ	Pennington Seed			*	*	*	*	*	
Seine	Seed Research of Oregon								x
Select	FFR/Southern States	x	x	*	*	*	*		*
Stockman	Seed Research of Oregon	*	x	*	*				*
Experimental Varieties									
ARGL									x
CIS-FTF24	Cebeco International Seeds	x	*						
CIS-FTF25	Cebeco International Seeds	*	*						
CSN 2G	Radix Research, Inc.								x
EC409	Emerald Commodities, Inc					x	*	x	
ERF38	Radix Research, Inc.	x	x						
FABE9301a	Barenbrug USA					*	*	*	
KY31-[3]	KY Agric. Exp. Station	*	x			*	*	*	x
KYFA0006	KY Agric. Exp. Station	*	*						
KYFA9301	KY Agric. Exp. Station					*	x	*	
KYFA9304	KY Agric. Exp. Station	*	x	*	*	*	*	*	*
KYFA9602	KY Agric. Exp. Station	x	x	*	*				x
KYFA9611	KY Agric. Exp. Station	*	x						*
KYFA9811	KY Agric. Exp. Station								*
KYFA9819 (FL)	KY Agric. Exp. Station	x	x	*					
KYFA9901	KY Agric. Exp. Station								x
KYFA9905	KY Agric. Exp. Station								*
KYFA9917	KY Agric. Exp. Station								x
KYTF2	KY Agric. Exp. Station	*	x	*	*				*
MRF42	Radix Research, Inc.	x	x						
PBR	Barenbrug USA					x	*	x	
PST-5NF	Turf- Seed, Inc.								*
RAD-MA216	Lewis Seed Co.					*	*	*	

*Not significantly different from the highest yielding variety in the test.
Open boxes indicate the variety was not in the test.
x in the box indicates the variety was in the test but yielded significantly less than the top yielding variety in the test.
[1] Establishment year
[2] Harvest year.
[3] "+" indicates variety is endophyte infected; "-" indicates variety is endophyte free.

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