

2002 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 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 Princeton (2000), Lexington (2001), and Quicksand (2001). 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 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 2002 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 Princeton, Lexington, and Quicksand, Kentucky, in 2002.

	Princeton				Lexington				Quicksand			
	Temp		Rainfall		Temp		Rainfall		Temp		Rainfall	
	°F	DEP	IN	DEP	°F	DEP	IN	DEP	°F	DEP	IN	DEP
JAN	41	+7	3.79	-0.01	38	+7	2.12	-0.74	41	+10	3.84	+55
FEB	42	+4	2.40	-2.03	38	+3	1.28	-1.93	39	+6	1.27	-2.33
MAR	49	+2	8.18	+3.24	45	+1	7.93	+3.53	47	+6	7.81	+3.47
APR	63	+4	5.72	+0.92	58	+3	4.19	+0.31	60	+7	3.84	-.26
MAY	66	-1	9.04	+4.08	61	-3	4.36	-0.11	62	0	5.12	+64
JUN	77	+2	1.88	-1.97	74	+2	2.45	-1.21	74	+4	4.61	+79
JUL	81	+3	2.13	-2.16	78	+2	1.10	-3.90	77	+3	5.14	-.11
AUG	80	+3	2.06	-1.95	77	+2	0.95	-2.98	76	+3	1.83	-2.18
SEP	74	+3	5.90	+2.57	72	+4	4.90	+1.70	71	+5	6.26	+2.74
OCT	59	0	6.12	+3.07	55	-2	5.61	+3.04	58	+4	6.47	+3.56
NOV	47	0	2.49	-2.14	43	-2	3.76	+0.37	45	+3	3.81	-.07
AVG	61.7	+2.5	4.5	+3.62	58.1	+1.6	3.5	-0.2	59.1	+4.6	4.6	+0.6

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

Table 2. Dry matter yield (tons/acre) of tall fescue, festulolium (FL), meadow brome (MB), and timothy (T) varieties sown September 21, 2000, at Princeton, Kentucky.

Variety	Total 2001	Maturity ¹ May 30, 2002	2002 Harvests			Total 2002	2-yr Total
			May 30	Jul 8	Oct 22		
Commercial Varieties — Available for Farm Use							
KY 31+ ²	6.68	74	3.14	1.06	0.78	4.98	11.66*
Select	6.56	78	3.44	0.62	0.69	4.75	11.32*
Bull	6.23	84	3.19	0.82	0.77	4.78	11.02*
Vorage (FL)	7.03	69	2.80	0.74	0.07	3.61	10.64*
Kokanee	5.45	71	2.63	0.87	0.36	3.85	9.30
Paddock (MB)	4.92	71	2.96	0.72	0.69	4.37	9.29
Outlaw (T)	4.50	50	3.68	0.48	0.21	4.37	8.87
Tuukka (T)	3.65	58	2.96	0.94	0.11	4.01	7.66
Experimental Varieties							
KYFA9304	7.16	74	2.77	0.96	0.69	4.43	11.59*
KY 31- ²	6.46	70	3.08	0.81	0.71	4.59	11.05*
KYFA 9301	6.49	75	2.69	0.93	0.68	4.30	10.79*
KYFA 9402	6.17	72	2.83	0.77	0.65	4.25	10.43
CAS-EA79	6.05	74	2.48	1.07	0.79	4.34	10.39
Q4508	6.33	83	2.09	1.20	0.76	4.05	10.38
KYTF 2	5.95	70	2.92	0.78	0.66	4.36	10.30
KYFA 9401	6.12	70	2.57	0.79	0.73	4.09	10.21
KYFA 9403	5.98	74	2.53	0.83	0.63	3.99	9.96
R4663	4.01	75	2.28	0.90	0.51	3.69	7.71
Mean	5.88	72	2.84	0.85	0.58	4.27	10.14
CV, %	10.50	8.69	12.19	25.20	21.46	9.82	8.08
LSD, 0.05	0.88	12.34	0.49	0.30	0.18	0.60	1.16

* 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 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 yield (tons/acre) of tall fescue, prairie brome (PB, *Bromus willdenoii*), and festulolium (FL) varieties sown September 7, 2001, in Lexington, Kentucky.

Variety	Vigor ¹ Nov 2, 2001	Maturity ² May 5, 2002	2002 Harvests				Total 2002
			May 5	Jun 5	Jul 18	Nov 8	
Commercial Varieties — Available for Farm Use							
Tuscany	3	53	2.31	1.07	0.89	1.41	5.67*
Ky31+ ³	5	49	1.95	1.15	0.92	1.50	5.52*
Atom (PB)	5	63	1.86	1.81	0.78	1.05	5.50*
Select	4	56	2.07	1.04	1.04	1.33	5.48*
Festival	4	55	2.15	1.41	0.76	1.06	5.38*
Carmine	4	53	1.71	1.15	0.92	1.31	5.09*
Felina (FL)	4	54	1.90	1.10	0.94	1.10	5.04*
Hoedown	3	59	1.85	1.04	0.87	1.24	5.01*
Johnstone	5	57	2.03	1.47	0.46	0.98	4.95
Spring Green (FL)	5	46	2.62	1.45	0.50	0.34	4.91
Maximize	4	56	1.72	1.02	0.75	1.38	4.87
Lakota (PB)	5	62	1.47	1.60	0.68	0.93	4.68
Kokanee	4	38	1.49	1.53	0.79	0.58	4.40
Resolute	4	43	0.94	1.07	0.58	1.17	3.75
Dixon (PB)	5	54	1.13	1.31	0.50	0.59	3.53
Experimental Varieties							
KY 31- ³	4	53	1.94	1.39	1.14	1.36	5.83*
KYFA 9304	4	52	1.94	1.37	1.21	1.25	5.77*
TF 9503	3	50	1.92	1.10	0.84	1.28	5.14*
BAR FA 1004	4	60	1.63	1.20	0.84	1.35	5.03*
BTR 12	4	51	1.66	1.19	0.79	1.29	4.93
KYFA 9301	5	50	1.68	1.00	0.90	1.34	4.91
FABE 9301	2	48	1.61	0.96	0.88	1.43	4.88
BTR 11	4	58	1.67	1.07	0.85	1.20	4.79
K5666V	3	53	1.49	0.84	0.80	1.19	4.31
PP10	3	51	1.40	0.98	0.73	1.05	4.16
Mean	4.0	52.8	1.77	1.21	0.82	1.15	4.94
CV, %	16.90	5.17	17.11	14.23	21.22	13.27	12.18
LSD, 0.05	0.95	3.85	0.43	0.24	0.24	0.22	0.85

* Not significantly different from the highest 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 4, Dry matter yields (tons/acre) of tall fescue and festulolium (FL) varieties sown September 18, 2001, at Quicksand, Kentucky.

Variety	Maturity ¹ May 16, 2002	2002 Harvests				Total 2002
		May 16	Jul 12	Aug 6	Nov 14	
Commercial Varieties — Available for Farm Use						
Select	58	1.70	1.81	0.86	2.03	6.40*
KY 31+ ²	53	1.43	1.80	0.95	2.06	6.24*
Festival	58	1.93	1.47	0.70	1.56	5.67*
Hoedown	60	1.43	1.47	0.71	1.87	5.48
Spring Green (FL)	51	2.59	1.43	0.35	0.69	5.07
Carmine	55	0.93	1.24	0.72	2.13	5.03
Maximize	56	1.00	1.74	0.67	1.46	4.87
Resolute	30	0.51	0.71	0.19	1.55	2.95
Experimental Varieties						
KYFA 9304	53	1.54	1.95	0.90	2.11	6.49*
TF 9503	55	1.43	2.06	0.87	1.93	6.29*
HM4 -NE ²	57	1.43	1.74	0.79	2.05	6.01*
KY 31- ²	55	1.30	1.61	0.87	1.81	5.59*
KYFA 9301	51	1.10	1.90	0.84	1.66	5.50
BAR FA 1004	60	0.95	1.46	1.02	1.95	5.39
Mean	53.7	1.38	1.60	0.75	1.78	5.50
CV, %	3.73	16.50	16.43	13.72	21.31	11.99
LSD, 0.05	2.86	0.33	0.38	0.15	0.54	0.94

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

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

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

Variety	Proprietor/KY Distributor	Lexington	Quicksand	Princeton	
		2001 ¹	2001	2000	
		02 ²	02	01	02
Commercial Varieties — Available for Farm Use					
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+ ³	KY Agric. Exp. Sta./Public	*	*	*	*
Lakota (PB)	Ampac Seed Company				
Maximize	Turf-Seed, Inc.				
Outlaw (T)	Grassland West Company				
Paddock (MB)	Grassland West Company				
Resolute	Ampac Seed Company				
Select	FFR Cooperative	*	*	*	*
Spring Green (FL)	Turf-Seed, Inc.				
Tuscany II	Forage Genetics International	*			
Tuukka (T)	Ampac Seed Company				
Vorage (FL)	Improved Forages			*	*
Experimental Varieties — Not Available for Farm Use					
BAR FA 1004	Barenbrug USA	*			
BTR 11	Barenbrug USA				
BTR 12	Barenbrug USA				
CAS-EA79	Cascade International Seed				
FA BE 9301	Barenbrug USA				
HM4 ne ³	FFR Cooperative		*		
K 5666V	Ampac Seed Company				
Ky 31- ³	KY Agric. Exp. Sta./Experimental	*	*	*	*
KYFA 9301	KY Agric. Exp. Sta./Experimental			*	*
KYFA 9304	KY Agric. Exp. Sta./Experimental	*	*	*	*
KYFA 9401	KY Agric. Exp. Sta./Experimental				
KYFA 9402	KY Agric. Exp. Sta./Experimental				
KYFA 9403	KY Agric. Exp. Sta./Experimental				
KYTF 2	KY Agric. Exp. Sta./Experimental				
PP 10	Ampac				
Q4508	Wrightson Seed LTD.			*	
R4663	Wrightson Seed LTD.				
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.

1 Establishment year.

2 Harvest year.

3 "+" indicates variety is endophyte infected; "-" indicates variety is endophyte free; "ne" indicates variety is infected with novel or friendly endophyte.

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