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2008 Tall Fescue and Brome 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 nontoxic endophyte. Varieties in the latter group are also referred to as "novel" or "friendly" endophyte varieties, because their endophyte improves stand survival without creating animal production problems.

Smooth brome (*Bromus inermis* Leyss) is a perennial pasture and hay grass imported from Europe. It has creeping underground stems or rootstocks from which the leafy stems arise. Smooth brome is very palatable to all classes of livestock from emergence to the heading stage. Meadow brome (*Bromus biebersteinii* Roem. & Schult) is a native of southeastern Europe and the adjacent near East. It resembles smooth brome but has only short or no rhizomes. Meadow brome is densely tufted and has a similar growth habit to tall fescue. Hybrid bromes are a cross between smooth and meadow bromes. All perennial brome grasses have several advantages over tall fescue including retaining quality as they mature and better growth during dry weather, but they are generally less well adapted in Kentucky.

Festuloliums are hybrids between various fescues and ryegrasses with higher quality than tall fescue and improved stand survival over perennial ryegrasses. Their use in Kentucky is still limited since they do not survive as long as tall fescue.

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. Table 11 shows a summary of all tall fescue and festulolium varieties tested in Kentucky for the past nine years. The UK Forage Extension Web site at <www.uky.edu/Ag/Forage> contains electronic versions of all forage variety testing reports from Kentucky and surrounding states and a large number of 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 originated. In general, the Mediterranean types (e.g., Cajun and Fawn) 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 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 percent is regarded as 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 toxic 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. With "novel endophyte" varieties you want them to have a high infection level to improve stand survival.

Seed Quality. Buy premium-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 the amount of 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 five studies is reported. Tall fescue varieties were sown at Lexington (2005 and 2007), Quicksand (2005), and Princeton (2006). The brome trial was sown in Lexington in 2006. The soils at Lexington (Maury), Quicksand (Pope), and Princeton (Crider) are well-drained silt loams. All are well suited for tall fescue and brome production.

Seedings were made at the rate of 25 lb/A for tall fescue and 20 lb/A for brome into a prepared seedbed with a disk drill. Plots were 5 by 20 feet in a randomized complete block design with four replications with a harvested plot area of 5 by

15 feet. 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/A) are reported in Tables 4 through 8. Yields are given by cutting date and as total annual production. Stated yields are adjusted for percent weeds, therefore the tonnage given is for crop only. 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.

Tables 9 and 10 summarize information about distributors, 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; commercial varieties can be purchased from agricultural distributors. In Tables 9 and 10, an open block indicates that the variety was not in that particular test (labeled at the top of the column); 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 and brome varieties (Tables 4 through 8).

Table 11 is a summary of yield data from 1999 to 2008 of commercial varieties that have been entered in the Kentucky trials. The data is listed as a percentage of the mean of the commercial varieties entered in each specific trial. In other words, the mean for each trial is 100 percent—varieties with percentages over 100 yielded better than average and varieties with percentages less than 100 yielded lower than average. Direct, statistical comparisons of varieties cannot be made using the summary Table 11, but these comparisons do help to identify varieties for further consideration. Varieties that have performed better than average over many years and at several locations have very stable performance, while others may have performed very well in wet years or on particular soil types. These details may influence variety choice and

Table 1. Temperature and rainfall at Lexington, Kentucky in 2005, 2006, 2007 and 2008.

	2005				2006				2007				2008			
	Temperature		Rainfall		Temperature		Rainfall		Temperature		Rainfall		Temperature		Rainfall	
	°F	DEP	IN	DEP	°F	DEP	IN	DEP	°F	DEP	IN	DEP	°F	DEP	IN	DEP
JAN	37	+6	4.35	+1.49	42	+11	4.77	+1.91	37	+6	2.93	+0.07	33	+2	4.60	+1.74
FEB	39	+4	1.68	-1.53	36	+1	2.13	-1.08	27	-8	1.83	-1.38	36	+1	5.37	+2.16
MAR	41	-3	2.79	-1.61	44	0	3.05	-1.35	52	+8	1.97	-2.43	45	+1	6.28	+1.88
APR	56	+1	3.30	-0.58	59	+4	3.52	-0.36	53	-2	3.87	-0.01	55	0	5.72	+1.84
MAY	61	-3	1.78	-2.69	62	-2	2.99	-1.48	68	+4	1.45	-3.02	62	-2	4.88	+0.41
JUN	75	+3	1.33	-2.33	70	-2	1.82	-1.84	74	+2	1.77	-1.89	74	+2	3.30	-0.36
JUL	77	+1	3.30	-1.70	76	0	5.13	+0.13	74	-2	6.90	+1.90	76	0	2.54	-2.46
AUG	78	+3	3.34	-0.59	76	+1	3.23	-0.70	80	+5	2.56	-1.37	75	0	1.08	-2.85
SEP	72	+4	0.59	-2.21	64	-4	9.27	+6.07	72	+4	1.15	-2.05	72	+4	1.21	-1.99
OCT	58	+1	0.92	-1.65	54	-3	4.88	+2.31	63	+6	5.28	+2.71	57	0	1.35	-1.22
NOV	47	+2	1.54	-1.85	47	+2	1.78	-1.61	46	+1	2.86	-0.53	43	-2	2.28	-1.11
DEC	32	-4	2.19	-1.79	42	+6	2.45	-1.53	40	+4	5.29	+1.31				
Total			27.51	-17.04			45.02	+0.47			37.86	-6.69			38.61	-1.96

DEP is departure from the long-term average.
2008 data is for eleven months through November.

the information can be found in the yearly reports. See footnote in Table 11 to determine which yearly report to refer to.

Summary

Selecting a good variety of tall fescue and brome 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 and on the web at www.uky.edu/Ag/Forage:

- 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
- AGR-175—Forage Identification and Use Guide

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Table 2. Temperature and rainfall at Princeton, Kentucky in 2006, 2007 and 2008.

	2006				2007				2008			
	Temperature		Rainfall		Temperature		Rainfall		Temperature		Rainfall	
	°F	DEP	IN	DEP	°F	DEP	IN	DEP	°F	DEP	IN	DEP
JAN	46	+12	5.38	+1.58	40	+6	4.89	+1.09	37	+3	2.40	-1.40
FEB	38	0	2.66	-1.77	34	-4	2.99	-1.44	39	+1	6.76	+2.33
MAR	51	+4	4.22	-0.72	58	+11	1.85	-3.09	48	+1	7.55	+2.61
APR	63	+4	4.02	-0.78	58	-1	3.95	-0.85	58	-1	6.56	+1.76
MAY	66	-1	5.42	+0.46	71	+4	2.29	-2.67	65	-2	6.19	+1.23
JUN	75	0	3.39	-0.46	76	+1	4.32	+0.47	78	+3	1.24	-2.61
JUL	79	+1	3.79	-0.50	77	-1	1.77	-2.52	79	+1	5.12	+0.83
AUG	80	+3	2.58	-1.43	85	+8	0.87	-3.14	77	0	0.69	-3.32
SEP	67	-4	9.80	+6.47	75	+4	3.52	+0.19	74	+3	0.61	-2.72
OCT	57	-2	4.5	+1.45	65	+6	5.84	+2.79	60	+1	2.21	-0.84
NOV	49	+2	4.31	-0.32	49	+2	2.31	-2.32	46	-1	2.59	-2.04
DEC	44	+5	4.76	-0.28	42	+3	10.83	+5.79				
Total			54.82	+3.69			47.92	-3.21			41.96	-4.13

DEP is departure from the long-term average.
2008 data is for eleven months through November.

Table 3. Temperature and rainfall at Quicksand, Kentucky in 2005, 2006, 2007 and 2008.

	2005				2006				2007				2008			
	Temperature		Rainfall		Temperature		Rainfall		Temperature		Rainfall		Temperature		Rainfall	
	°F	DEP	IN	DEP	°F	DEP	IN	DEP	°F	DEP	IN	DEP	°F	DEP	IN	DEP
JAN	40	+9	4.45	+1.16	44	+13	4.48	+1.19	38	+7	2.70	-0.59	34	+3	2.07	-1.22
FEB	42	+9	3.01	-0.59	37	+4	1.56	-2.04	31	-2	0.61	-2.99	38	+5	3.52	-0.08
MAR	44	+3	2.86	-1.48	47	+6	1.74	-2.60	54	+13	2.70	-1.64	46	+5	3.62	-0.72
APR	58	+5	6.63	+2.53	60	+7	2.95	-1.15	55	+2	1.71	-2.39	56	+3	3.99	-0.11
MAY	63	+1	2.05	-2.43	63	+1	3.45	-1.03	69	+7	1.82	-2.66	63	+1	3.69	-1.79
JUN	75	+5	2.39	-1.43	71	+1	3.00	-0.82	75	+5	1.95	-1.87	75	+5	3.96	+0.14
JUL	78	+4	2.58	-2.67	77	+3	3.85	-1.40	76	+2	4.00	-1.25	76	+2	4.96	-0.29
AUG	79	+6	3.51	-0.50	78	+5	3.55	-.046	82	+9	2.41	-1.60	74	+1	1.16	-2.85
SEP	72	+6	0.27	-3.25	65	-1	5.56	+2.04	73	+7	2.49	-1.03	72	+6	0.15	-3.37
OCT	59	+5	0.68	-2.23	55	+1	6.00	+3.09	63	+9	3.80	+0.89	58	+4	1.02	-1.89
NOV	49	+7	1.30	-2.58	48	+6	2.32	-1.56	47	+5	1.80	-2.08	44	+2	2.14	-1.74
DEC	34	+1	2.39	-1.75	43	+10	1.55	-2.59	42	+8	4.44	+0.30				
Total			32.12	-15.22			40.07	-7.27			30.43	-16.91			29.28	-13.92

DEP is departure from the long-term average.
2008 data is for eleven months through November.

Table 4. Dry matter yields, seedling vigor, maturity and stand persistence of tall fescue and festulolium (FL) varieties sown September 12, 2005 at Lexington, Kentucky.

Variety	Seedling Vigor[1] Nov 7, 2005	Maturity[2]			Percent Stand						Yield (tons/acre)						
		2006	2007	2008	2006		2007		2008		2006	2007	2008				3-year Total
		May 15	May 11	May 6	Apr 17	Oct 17	Apr 26	Oct 11	Apr 1	Oct 12	Total	Total	May 6	Jun 24	Aug 13	Total	
Commercial Varieties-Available for Farm Use																	
KY31+[3]	3.0	56.5	56.0	51.0	100	98	98	97	98	98	4.77	2.47	1.39	0.49	0.23	2.11	9.35*
Bull	2.0	60.0	57.5	57.0	95	94	95	93	94	94	4.55	2.03	1.68	0.38	0.18	2.24	8.82
Spring Green (FL)	4.8	53.0	32.8	37.5	100	94	94	79	76	69	5.20	2.13	0.82	0.50	0.07	1.40	8.73
Bariane	1.5	55.5	50.0	43.0	79	89	88	90	70	69	5.52	2.04	0.44	0.38	0.20	1.02	8.58
Select	2.0	59.0	56.5	54.5	94	94	95	95	68	69	5.09	2.00	1.11	0.29	0.09	1.49	8.58
Jesup MaxQ	1.5	59.0	56.0	54.5	95	96	97	93	83	82	4.58	2.20	1.27	0.25	0.23	1.75	8.54
Barolex	1.8	58.0	55.0	45.0	85	84	84	86	85	90	4.08	1.98	1.17	0.43	0.18	1.78	7.84
Bronson	2.5	59.5	56.0	53.0	91	94	95	95	88	85	4.23	1.81	1.07	0.27	0.24	1.58	7.62
Duo (FL)	4.5	56.5	32.5	33.0	100	79	83	60	58	50	4.15	1.77	0.57	0.45	0.05	1.07	6.99
Experimental Varieties																	
BARFA BE9301a	2.8	57.5	53.5	43.5	96	98	97	96	88	90	5.41	2.88	1.48	0.53	0.27	2.27	10.56*
AGRFA 148	3.0	59.5	56.0	47.5	96	94	95	95	78	90	5.35	2.17	1.16	0.26	0.22	1.65	9.17*
KYFA 9821/AR584	3.0	58.0	56.5	51.5	95	94	94	96	92	94	4.69	2.28	1.38	0.43	0.23	2.05	9.01*
AGRFA 118	4.5	58.5	56.5	55.5	99	95	94	94	93	93	4.80	2.13	1.49	0.32	0.18	1.98	8.92*
AGRFA 128	2.3	59.5	54.5	51.5	94	94	95	94	76	77	4.64	2.35	1.22	0.27	0.16	1.65	8.64
KY31-[3]	2.8	58.5	55.5	52.5	99	96	97	96	88	90	4.68	2.21	1.15	0.35	0.21	1.70	8.59
KYFA 9301/AR584	3.3	58.0	56.0	50.5	99	98	97	96	78	83	4.97	2.17	0.86	0.23	0.18	1.27	8.41
KYFA 9304EF	3.3	59.0	56.0	50.5	96	94	95	90	63	64	5.60	1.84	0.53	0.24	0.19	0.96	8.41
IS-FTF-25	3.0	59.0	56.0	54.0	98	94	95	93	89	94	5.05	1.86	0.91	0.32	0.20	1.44	8.34
KYFA 9821/AR542	2.0	58.5	57.0	52.5	96	94	95	95	95	97	4.02	2.24	1.49	0.38	0.15	2.02	8.28
KYFA 9301/AR542	2.5	57.5	55.5	52.7	95	94	94	92	72	73	4.98	1.96	0.82	0.25	0.20	1.26	8.21
AGRFA 144	3.0	60.0	56.0	53.5	94	96	96	96	92	91	4.23	2.08	1.36	0.28	0.25	1.89	8.20
AGRFA 129	2.0	59.5	55.5	52.7	96	93	93	83	58	55	5.07	1.97	0.58	0.26	0.15	0.98	8.03
KYFA 9821EF	2.3	57.5	56.5	52.0	96	96	97	95	88	86	4.24	1.87	1.18	0.33	0.22	1.73	7.84
RAD-ERF38	1.8	59.5	56.5	53.0	91	89	90	89	90	90	4.39	1.75	1.14	0.25	0.09	1.48	7.62
KYFA 9301EF	1.8	58.5	56.5	50.5	85	90	90	90	89	89	3.88	1.89	0.82	0.27	0.13	1.21	6.99
IS-FTF-12	1.3	59.5	56.5	53.0	78	80	81	85	81	89	3.31	1.88	0.89	0.32	0.21	1.42	6.61
CSN26	2.3	59.5	55.5	52.7	90	91	92	79	64	65	3.97	1.65	0.65	0.23	0.06	0.94	6.56
RAD-MRF44	2.0	57.5	55.0	46.7	89	93	93	91	61	68	4.35	1.54	0.31	0.23	0.13	0.67	6.55
UMTF	1.5	56.0	56.0	50.0	70	73	66	56	15	18	3.94	0.98	0.05	0.13	0.13	0.31	5.24
AGRFA 123	2.5	56.5	56.0	50.0	75	84	60	73	25	35	3.15	0.92	0.04	0.18	0.10	0.32	4.39
Mean	2.5	58.2	54.1	50.4	92.2	91.6	90.9	88.6	76.4	77.8	4.56	1.97	0.97	0.32	0.17	1.45	7.99
CV,%	33.5	2.6	1.8	4.4	10.3	7.2	6.8	10.9	24.2	24.7	20.1	18.0	42.7	30.8	52.3	34.6	15.5
LSD,0.05	1.2	2.1	1.4	3.5	13.4	9.2	8.7	13.6	26.0	27.0	1.29	0.50	0.58	0.14	0.13	0.71	1.74

[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 shed.
[3] "+" indicates variety is endophyte infected; "-" indicates variety is endophyte free.
*Not significantly different from the highest numerical value in the column, based on the 0.05 LSD.

Table 5. Dry matter yields and stand persistence of tall fescue varieties sown September 30, 2005 at Quicksand, Kentucky.

	Percent Stand						Yield (tons/acre)						
	2006		2007		2008		2006	2007	2008				3-yr
Variety	Apr 18	Nov 3	Apr 12	Oct 17	Apr 10	Nov 5	Total	Total	May 5	Jun 27	Nov 14	Total	Total
Commercial Varieties-Available for Farm Use													
KY31+[1]	100	97	97	97	96	99	7.38	4.18	2.18	1.28	0.71	4.17	15.74*
Jesup MaxQ	98	98	99	95	94	98	7.29	3.88	2.04	1.00	0.52	3.55	14.72*
Bronson	100	98	98	93	95	97	7.50	3.50	2.21	0.96	0.43	3.59	14.59*
Bariane	80	83	85	84	89	91	6.62	3.87	1.78	0.88	0.41	3.07	13.56
Select	100	100	100	100	98	100	6.68	3.09	1.52	1.04	0.45	3.01	12.78
Experimental Varieties													
KYFA 9821/AR584	100	99	98	95	93	95	8.28	4.40	2.24	1.02	0.54	3.80	16.48*
KYFA 9821	100	99	98	98	93	96	7.84	4.54	2.19	1.09	0.58	3.86	16.25*
KYFA 9301/AR542	98	98	99	99	99	100	7.83	4.22	2.45	1.04	0.54	4.03	16.08*
KYFA 9301	100	96	97	97	97	99	8.10	3.67	2.01	0.89	0.42	3.33	15.10*
KY31-[1]	100	98	99	99	95	98	7.51	4.12	1.58	1.13	0.68	3.39	15.02*
KYFA 9301/AR584	100	97	97	95	96	98	7.14	3.87	2.10	1.06	0.78	3.94	14.95*
KYFA 9821/AR542	99	99	97	97	96	98	6.18	3.61	1.66	1.26	0.80	3.72	13.51
Mean	97.8	96.7	96.8	95.6	94.8	97.2	7.36	3.91	2.00	1.06	0.57	3.62	14.90
CV,%	4.9	3.4	2.3	3.5	3.9	1.7	11.2	15.0	28.2	34.5	36.7	23.9	10.4
LSD,0.05	7.0	4.7	3.1	4.8	5.3	2.4	1.18	0.85	0.81	0.52	0.30	1.25	2.23

[1] "+" indicates variety is endophyte infected; "-" indicates variety is endophyte free.
*Not significantly different from the highest numerical value in the column, based on the 0.05 LSD.

Table 6. Dry matter yields, seedling vigor, maturity and stand persistence of tall fescue varieties sown September 6, 2006 at Princeton, Kentucky.

	Seedling Vigor[1] Oct 30,	Maturity[2]		Percent stand					Yield (tons/acre)					
		2007	2008	2006	2007		2008		2007	2008				2-year
Variety	2006	May 8	May 21	Oct 30	Apr 3	Oct 18	Apr 17	Oct 30	Total	May 21	Jun 26	Jul 29	Total	Total
Commercial Varieties-Available for Farm Use														
Select	3.5	56.8	60.0	100	100	100	100	100	3.42	1.97	0.66	0.33	2.96	6.38*
Tuscany II	4.0	56.0	60.0	100	100	98	100	98	3.41	1.88	0.66	0.36	2.91	6.32*
KY31+[3]	4.0	55.5	58.0	100	100	100	100	100	3.26	1.86	0.78	0.32	2.96	6.22*
Stockman	4.3	56.0	59.5	100	100	100	100	100	3.30	1.80	0.72	0.34	2.85	6.16*
Savory	3.3	55.0	60.0	100	100	99	100	100	2.96	1.90	0.62	0.29	2.81	5.77
Experimental Varieties														
GO-TF	3.5	56.0	60.0	99	99	99	100	99	3.37	2.26	0.68	0.36	3.30	6.67*
KYFA 9821/AR542	4.3	55.5	60.0	100	100	100	100	99	3.49	2.15	0.62	0.34	3.11	6.60*
KYFA 9801	4.8	56.0	60.0	100	100	99	100	99	3.41	2.08	0.66	0.34	3.08	6.49*
KYFA 9821/AR584	4.3	55.5	60.0	100	100	98	99	99	3.21	2.23	0.57	0.41	3.21	6.42*
IS FTF 31	3.8	56.3	60.0	100	99	97	100	100	3.20	2.20	0.60	0.39	3.19	6.38*
KYFA 9905	4.8	55.0	60.0	100	100	99	100	100	3.47	1.86	0.71	0.30	2.87	6.34*
KYFA 9821EF	4.3	56.3	60.0	100	100	98	100	100	3.11	2.23	0.61	0.38	3.22	6.33*
KYFA 9304	4.5	55.3	59.5	99	100	98	100	100	3.38	1.96	0.63	0.35	2.94	6.32*
TF4	3.8	55.8	60.0	100	75	100	100	100	3.31	1.92	0.69	0.37	2.97	6.28*
KYFA 9301EF	3.8	56.0	60.0	100	100	100	100	99	3.30	1.97	0.67	0.33	2.97	6.27*
KYFA9301/AR584	4.3	56.3	60.0	100	100	98	99	98	3.18	2.00	0.66	0.37	3.03	6.21*
RAD-ERF48	3.8	57.0	60.0	100	100	99	100	100	3.06	2.07	0.66	0.38	3.12	6.18*
KY31-[3]	4.9	55.5	59.5	100	100	98	100	100	3.24	1.93	0.71	0.27	2.90	6.15*
KYFA 9808	5.0	56.3	60.0	100	100	98	100	100	3.28	1.93	0.61	0.30	2.84	6.12*
KYFA 9301/AR542	4.3	55.0	59.3	100	100	100	100	100	3.03	2.10	0.64	0.32	3.07	6.10*
KYFA 9908	3.3	55.0	58.3	98	100	98	99	98	3.26	1.82	0.64	0.35	2.81	6.07
KYFA 9402	2.8	56.8	60.0	98	99	100	99	98	3.12	1.88	0.60	0.32	2.80	5.92
KYTF2	2.8	55.0	59.5	97	99	98	99	99	2.98	1.90	0.67	0.33	2.90	5.88
Verdant	2.8	56.0	60.0	97	98	97	100	100	3.01	1.90	0.64	0.32	2.86	5.88
KYFA 9401	2.5	55.5	60.0	97	98	99	99	100	2.81	1.87	0.59	0.33	2.78	5.59
Mean	3.9	55.8	59.7	99.2	98.6	98.6	99.6	99.3	3.22	1.99	0.65	0.34	2.98	6.20
CV,%	15.1	1.6	1.3	1.5	10.2	1.5	0.8	1.3	7.1	14.3	9.9	20.1	10.1	6.8
LSD,0.05	0.8	1.3	1.1	2.0	14.1	2.1	1.2	1.8	0.32	0.40	0.09	0.10	0.42	0.59

[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 shed.
[3] "+" indicates variety is endophyte infected; "-" indicates variety is endophyte free.
*Not significantly different from the highest numerical value in the column, based on the 0.05 LSD.

Table 7. Dry matter yields,seedling vigor, maturity and stand persistence of tall fescue varieties sown September 6, 2007 at Lexington, Kentucky.

Variety	Seedling Vigor[1] Oct 25, 2007	Maturity[2] 2008	Percent Stand 2007	Percent Stand 2008		Yield (tons/acre) 2008			
		May 12	Oct 25	Mar 26	Oct 21	May 12	Jun 30	Aug 13	Total
Commercial Varieties-Available for Farm Use									
Select	2.0	56.5	97	100	100	2.04	0.52	0.35	2.91
Noria	3.0	54.5	100	100	100	1.79	0.57	0.42	2.78
BarElite	3.0	50.0	100	100	100	1.72	0.62	0.44	2.78
KY31+[3]	3.8	54.5	100	100	100	1.87	0.58	0.30	2.75
Bronson	3.0	56.5	100	100	100	1.77	0.52	0.33	2.61
TF0203G	2.3	56.5	100	100	100	1.85	0.48	0.27	2.60
Jesup MaxQ	2.3	57.0	97	99	100	1.84	0.41	0.31	2.56
Nanryo	2.8	58.0	100	100	100	1.67	0.59	0.30	2.55
Experimental Varieties									
KYFA 9821/AR584	4.0	55.0	100	100	100	2.36	0.68	0.45	3.49*
KYFA 9732	3.5	54.0	99	100	100	2.32	0.66	0.42	3.39*
KYFA 9908	3.0	53.0	100	100	100	2.20	0.67	0.46	3.32*
KYFA 9821	3.5	55.5	100	100	100	2.19	0.63	0.43	3.26*
KYFA 9301/AR584	4.0	53.5	100	100	100	2.27	0.56	0.33	3.15*
KYFA 9905	2.3	54.5	99	100	100	2.00	0.65	0.41	3.05*
RAD-ERF52	2.8	57.0	100	100	100	2.12	0.53	0.38	3.03*
RAD-MRF47	3.5	57.5	100	100	100	2.15	0.53	0.31	2.99
KYFA 9301	3.0	54.0	100	100	100	2.08	0.51	0.35	2.94
KY31-[3]	3.0	54.5	100	100	100	1.95	0.62	0.36	2.93
KYFA 9611	3.5	50.0	100	100	100	1.83	0.69	0.41	2.93
KYFA 9303	3.8	51.5	100	100	100	1.74	0.78	0.37	2.89
KYFA 0006	2.8	51.0	99	100	100	1.84	0.60	0.42	2.87
RAD-MRF51	2.8	55.5	100	100	100	1.83	0.55	0.32	2.70
KYFA 0008	1.8	55.0	96	99	100	1.86	0.50	0.30	2.66
BARFA BE9301A	2.8	52.5	100	100	100	1.81	0.49	0.31	2.61
BARFA MT9301	3.0	53.5	100	100	100	1.57	0.50	0.36	2.43
Mean	3.0	54.4	99.9	99.9	99.9	1.95	0.58	0.36	2.89
CV,%	21.1	2.6	1.2	0.1	0.4	12.0	18.6	29.5	12.2
LSD,0.05	0.9	1.9	1.7	0.8	0.6	0.33	0.15	0.15	0.50

[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 shed.
[3] "+" indicates variety is endophyte infected; "-" indicates variety is endophyte free.
*Not significantly different from the highest numerical value in the column, based on the 0.05 LSD.

Table 8. Dry matter yields, maturity and stand persistence of brome grass varieties sown March 27, 2006 at Lexington, Kentucky.

Variety	Type	Maturity[1] 2007	Maturity[1] 2008	Percent Stand 2006	Percent Stand 2007		Percent Stand 2008		Yield (tons/acre) 2006	Yield (tons/acre) 2007	Yield (tons/acre) 2008				3-yr
		May 11	May 6	Oct 17	Mar 26	Oct 12	Apr 4	Oct 21	Total	Total	May 6	Jun 23	Aug 12	Total	Total
Commercial Varieties-Available for Farm Use															
Fleet	meadow	60.0	56.0	88	88	84	88	85	3.70	4.43	2.19	0.89	0.30	3.37	11.50*
Bigfoot	hybrid	60.0	55.0	81	91	81	90	88	3.66	4.28	2.24	0.88	0.26	3.38	11.31*
RAD-BI29	smooth	52.0	45.0	81	86	71	83	61	3.37	3.36	2.03	0.77	0.14	2.94	9.68
ACKnowles	hybrid	58.0	53.5	75	80	70	71	58	3.00	3.22	1.74	0.84	0.23	2.81	9.04
Experimental Varieties															
KYBI0101	smooth	55.0	51.5	66	86	59	86	38	3.22	3.30	2.24	0.84	0.14	3.22	9.75
RAD-BIX28	hybrid	57.0	53.5	80	86	74	84	68	3.28	3.42	2.15	0.72	0.17	3.04	9.74
Mean		57.0	52.4	78.5	86.1	73.1	83.5	66.0	3.37	3.67	2.10	0.82	0.21	3.13	10.17
CV,%		1.7	1.2	9.7	6.1	9.7	7.4	20.8	11.5	7.8	11.2	7.6	30.6	8.9	6.4
LSD,0.05		1.5	0.9	11.5	8.0	10.7	9.3	20.7	0.58	0.43	0.36	0.09	0.10	0.42	0.98

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

Table 9. Performance of tall fescue and festulolium(FL) varieties across years and locations.

		Lexington				Quicksand			Princeton	
		2005[1]			2007	2005			2006	
Variety	**Proprietor/KY Distributor**	**06[2]**	**07**	**08**	**08**	**06**	**07**	**08**	**07**	**08**
Commercial Varieties-Available for Farm Use										
BarElite	Barenbrug USA				x[4]					
Bariane	Barenbrug USA	*	x	x		x	*	*		
Barolex	Barenbrug USA	x	x	*						
Bronson	Ampac Seed	x	x	*	x	*	x	*		
Bull	Improved Forages	*	x	*						
Duo (FL)	Ampac Seed	x	x	x						
KY31+[3]	Ky Agric. Exp. Station/Public	*	*	*	x	*	*	*	*	*
Jesup MaxQ	Pennington Seed	*	x	*	x	*	*	*		
Nanryo	Japanese Grassland Forage Seed				x					
	USDA-ARS, El Reno, OK									
Noria	ProSeeds Marketing				x					
Savory	DLF International Seed								x	x
Select	FFR/Southern States	*	x	x	x	x	x	*	*	*
Spring Green (FL)	Seed Research of Oregon	*	x	x						
Stockman	Seed Research of Oregon								*	*
TF 0203G	Seed Research of Oregon				x					
Tuscany II	Seed Research of Oregon								*	*
Experimental Varieties										
AGRFA 118	AgResearch USA	*	x	*						
AGRFA 123	AgResearch USA	x	x	x						
AGRFA 128	AgResearch USA	*	x	*						
AGRFA 129	AgResearch USA	*	x	x						
AGRFA144	Noble Foundation	x	x	*						
AGRFA148	Noble Foundation	*	x	*						
BARFA BE 9301a	Barenbrug USA	*	*	*	x					
BARFA MT9301	Barenbrug USA				x					
CSN 26	Fraser Seeds	x	x	x						
GO TF	Grassland Oregon								*	*
IS-FTF-12	DLF International Seed	x	x	x						
IS-FTF-25	DLF International Seed	*	x	x						
IS-FTF31	DLF International Seed								*	*
KY31-[3]	KY Agric. Exp. Station	*	x	*	x	*	*	*	*	*
KYFA 0006	KY Agric. Exp. Station				x					
KYFA 0008	KY Agric. Exp. Station				x					
KYFA9301	KY Agric. Exp. Station	x	x	x	x	*	x	*	*	*
KYFA9301/AR542	KY Agric. Exp. Station	*	x	x		*	*	*	x	*
KYFA9301/AR584	KY Agric. Exp. Station	*	x	x	*	*	*	*	*	*
KYFA 9303	KY Agric. Exp. Station				x					
KYFA9304	KY Agric. Exp. Station	*	x	x					*	*
KYFA9401	KY Agric. Exp. Statiion								x	x
KYFA9402	KY Agric. Exp. Statiion								x	x
KYFA9611	KY Agric. Exp. Station				x					
KYFA 9732	KY Agric. Exp. Station				*					
KYFA9801	KY Agric. Exp. Statiion								*	*
KYFA9808	KY Agric. Exp. Statiion								*	x
KYFA9821	KY Agric. Exp. Station	x	x	*	*	*	*	*	x	*
KYFA9821/AR542	KY Agric. Exp. Station	x	x	*		x	x	*	*	*
KYFA9821/AR584	KY Agric. Exp. Station	*	x	*	*	*	*	*	*	*
KYFA9905	KY Agric. Exp. Station				*				*	x
KYFA9908	KY Agric. Exp. Statiion				*				*	x
KYTF2	KY Agric. Exp. Station								x	*
RAD-ERF38	Columbia Seed	*	x	x						
RAD ERF48	Radix Research, Inc.								x	*
RAD ERF52	Radix Research, Inc.				*					
RAD-MRF44	Radix Research, Inc.	*	x	x						
RAD MRF47	Radix Research, Inc.				x					
RAD MRF51	Radix Research, Inc.				x					
TF4	Oregro Seeds, Inc.								*	*
UMTF	Univ. of Manitoba	x	x	x						
Verdant	American Grass Seed Producers								x	x

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

Table 10. Performance of brome grass varieties varieties at Lexington.					
			Lexington		
			2006[1]		
Variety	Type	Proprietor/KY Distributor	2006[2]	2007	2008
Commercial Varieties-Available for Farm Use					
AC Knowles	hybrid		x[3]	x	x
Bigfoot	hybrid	Grassland Oregon	*	*	*
Fleet	meadow		*	*	*
RAD-BI29	smooth	Columbia Seeds	*	x	x
Experimental Varieties					
KYBI 0101	smooth	KY Agric. Exp. Station	*	x	*
RAD-BIx28	hybrid	Ampac Seed	*	x	*

[1] Establishment year.
[2] Harvest year.
[3] Open box indicates the variety was not in the test, while an "x" in the box indicates the variety was in the test but yielded significantly less than the top yielding variety.
*Not significantly different from the highest yielding variety in the test.

Table 11. Summary of Kentucky Tall Fescue Yield Trials 1999-2008 (yield shown as a percentage of the mean of the commercial varieties in the trial).

		Lexington				Princeton					Quicksand				
Variety	Proprietor	1999[1,2] 2-yr[4]	2001 3-yr	2003 2-yr	2005 3-yr	1998 2-yr	2000 2-yr	2002 3-yr	2004 3-yr	2006 2-yr	1999 2-yr	2001 2-yr	2003 2-yr	2005 3-yr	Mean[3] (#trials)
Atlas	Proseeds	107									89				98(2)
Bariane	Barenbrug			87	103									95	95(3)
Barolex	Barenbrug				94										–
BAR 9 TMPO	Barenbrug	96									97				97(2)
Bronson	Ampac Seed				91									102	96(2)
Bull	Improved Forages			98	106		102	103					97		101(5)
Carmine	DLF International		99									97			98(2)
DLF-B	DLF International	96													–
Enhance	Allied Seed								111						–
Festival	Pickseed West		107						106			107			107(3)
Fuego	Advanta Seeds	99													–
Hoedown	DLF International		104									106			105(2)
Jesup EF	Pennington Seed					106									–
Jesup MaxQ	Pennington Seed				102			98					100	103	101(4)
Johnstone	Proseeds	95	108								95				99(3)
KENHY	KY Agric Exp Sta.								92						–
Kokanee	Ampac Seed		89				86								88(2)
KY31+	KY Agric Exp Sta.	102	118	113	112	122	108	104	77	101	107	124	98	110	107(13)
Maximize	Turf-Seed	96	95								105	93			97(4)
Resolute	Ampac Seed		90									65			78(2)
Savory	DLF International									94					
Seine	Advanta Seeds	99							100						99(2)
Select	FFR/Sou. St.	106	106	94	103	105	105	95	109	103	107	112	102	90	103(13)
Stockman	Seed Research of OR			109					104	100			105		105(4)
TF33	Barenbrug					70									–
Tuscany	Forage Genetics		112												–
Tuscany II	Seed Research of OR									102					–
Vulcan	International Seeds					97									–
Summary of Kentucky Festulolium Yield Trials															
Duo	Ampac Seed	104			84										94(2)
Felina	DLF International		101												–
Hykor	DLF International			98									98		98(2)
Spring Green	Turf-Seed		88		105							97			97(3)
Vorage	Improved Forages						99								–

[1] Year trial was established.
[2] Use this summary table as a guide in making variety decisions, but refer to specific yearly reports to determine statistical differences in forage yield between varieties. To find actual yields, look in the yearly report for the final year of each specific trial. For example, the Lexington trial planted in 1999 was harvested 2 years, so the final report would be "2001 Tall Fescue Report" archived in the KY Forage website at <www.uky.edu/Ag/Forage>.
[3] Mean only presented when respective variety was included in two or more trials.
[4] Number of years of data.

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