



2017 Tall Fescue and Bromegrass Report

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Introduction

Tall fescue (*Festuca arundinacea*) is a productive, well-adapted, persistent, soil-conserving, cool-season grass grown on approximately 5½ 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 produces ergot alkaloids and 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 bromegrass (*Bromus inermis* Leyss) is a perennial pasture and hay grass native of Europe. It has creeping underground stems or rootstocks from which the leafy stems arise. Smooth bromegrass is palatable to all classes of livestock, from emergence to the heading stage. Meadow bromegrass (*Bromus biebersteinii* Roem. & Schult) is a native of southeastern Europe and the adjacent Near East. It resembles smooth bromegrass but has only short rhizomes or none at all. Meadow bromegrass is densely tufted and has a similar growth habit to tall fescue. Hybrid bromegrasses are a cross between smooth and meadow bromegrasses. Alaska bromegrass (*Bromus sitchensis*), also called Sitka bromegrass, is a long-lived perennial bunchgrass that will actively grow at moderate rates during the spring and

summer season. It does not spread by rhizomes and is more suited to environments with harsh winters.

Prairie bromegrass (*Bromus willdenowii*) is a tall, cool-season, leafy short-lived, perennial, deep-rooted bunchgrass. It was introduced from South America. Seedheads are produced throughout the growing season, and to maintain productive stands for several years, it is necessary to manage at least one growth cycle each year for seed production and natural reseeding. Some prairie bromegrasses are susceptible to winterkill. Mountain bromegrass (*Bromus marginatus*) is native to North America from Alaska to northern Mexico, where it can be found in many types of habitat. It is a short-lived, perennial, cool-season, sod-forming grass. Leafy growth and a deep, well-

Table 1. Temperature and rainfall at Lexington, Kentucky, in 2015, 2016, and 2017.

	2015				2016				2017 ²			
	Temp		Rainfall		Temp		Rainfall		Temp		Rainfall	
	°F	DEP ¹	IN	DEP	°F	DEP	IN	DEP	°F	DEP	IN	DEP
JAN	32	+1	2.17	-0.69	32	+1	0.80	-2.06	40	+9	6.81	+3.95
FEB	26	-9	3.08	-0.13	38	+3	6.09	+2.88	47	+12	4.46	+1.25
MAR	45	+1	7.34	+2.94	52	+8	4.07	-0.33	48	+4	3.34	-1.06
APR	57	+2	13.19	+9.31	57	+2	3.97	+0.09	62	+7	4.17	+0.29
MAY	69	+5	3.02	-1.45	64	0	9.17	+4.70	66	+2	7.74	+3.27
JUN	75	+3	8.20	+4.54	76	+4	5.09	+1.43	73	+1	7.68	+4.02
JUL	77	+1	10.22	+5.22	79	+3	7.43	+2.43	76	0	4.49	-0.51
AUG	74	-1	3.49	-0.44	79	+4	4.37	+0.44	74	-1	6.66	+2.73
SEP	72	+4	3.49	+0.29	74	+6	2.18	-1.02	69	+1	4.72	+1.52
OCT	59	+2	2.78	+0.21	64	+7	0.37	-2.20	60	+3	6.06	+3.49
NOV	51	+6	3.72	+0.33	51	+6	1.94	-1.45				
DEC	49	+13	8.42	+4.44	37	+1	9.4	+5.42				
Total			69.12	+24.57			54.88	+10.33			56.13	+18.95

¹ DEP is departure from the long-term average.

² 2017 data is for ten months through October.

Table 2. Temperature and rainfall at Princeton, Kentucky, in 2015, 2016, and 2017.

	2015				2016				2017 ²			
	Temp		Rainfall		Temp		Rainfall		Temp		Rainfall	
	°F	DEP ¹	IN	DEP	°F	DEP	IN	DEP	°F	DEP	IN	DEP
JAN	34	0	1.51	-2.29	35	+1	1.37	-2.43	43	+9	3.18	-0.62
FEB	28	-10	4.16	-0.27	40	+2	4.23	-0.20	49	+11	1.78	-2.65
MAR	46	-1	6.83	+1.89	53	+6	7.3	+2.36	50	+3	4.09	-0.85
APR	60	+1	7.38	+2.58	59	0	4.41	-0.39	63	+4	4.28	-0.52
MAY	68	+1	3.52	-1.44	64	-3	6.21	+1.25	67	0	4.43	-0.53
JUN	76	+1	2.85	-1.00	77	+2	2.18	-1.67	74	-1	5.39	+1.54
JUL	79	+1	8.83	+4.54	80	+2	12.72	+8.43	78	0	2.23	-2.06
AUG	73	-4	2.90	-1.11	78	+2	5.37	+1.36	75	-2	1.39	-2.62
SEP	71	0	0.82	-2.51	73	+2	1.33	-2.00	71	0	3.93	+0.60
OCT	60	+1	4.15	+1.10	65	+6	0.25	-2.80	61	+2	6.65	+3.60
NOV	53	+6	5.95	+1.32	52	+5	2.86	-1.77				
DEC	49	+10	6.37	+1.33	38	-1	6.51	+1.47				
Total			55.27	+4.14			54.74	+3.61			38.35	-4.11

¹ DEP is departure from the long-term average.

² 2017 data is for the ten months through October.

Table 3. Temperature and rainfall at Quicksand, Kentucky, in 2016 and 2017.

	2016				2017 ²			
	Temp		Rainfall		Temp		Rainfall	
	°F	DEP ¹	IN	DEP	°F	DEP	IN	DEP
JAN	32	+1	2.76	-0.53	43	+12	4.61	+1.32
FEB	40	+7	6.06	+2.46	46	+13	2.27	-1.33
MAR	51	+10	2.16	-2.18	48	+7	4.13	-0.21
APR	57	+4	3.53	-0.57	62	+9	4.23	+0.13
MAY	63	+1	8.04	+3.56	65	+3	6.33	+1.85
JUN	73	+3	5.51	+1.69	71	+1	5.82	+2.00
JUL	78	+4	6.52	+1.27	76	+2	5.76	+0.51
AUG	78	+5	5.59	+1.58	73	0	6.59	+2.58
SEP	72	+6	1.05	-2.47	68	+2	2.57	-0.95
OCT	62	+8	1.01	-1.90	59	+5	5.56	+2.65
NOV	49	+7	2.42	-1.46				
DEC	38	+5	5.62	+1.49				
Total			50.27	+2.93			47.87	+8.55

¹ DEP is departure from the long-term average.

² 2017 data is for the ten months through October.

branched root system give protection on erodible slopes. It is similar to California bromegrass (*Bromus carinatus*), and some consider them to be synonymous.

All bromegrasses 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.

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. Tables 15 and 16 show a summary of all tall fescue and bromegrass varieties tested in Kentucky for the past 17 years. The UK Forage Extension website 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 “continental” 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 continental 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 continental varieties to leaf diseases such as helminthosporium and rhizoctonia. Therefore, Mediterranean varieties are less preferred for use in Kentucky than continental 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 continental 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. “Novel endophyte” varieties need 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.

Table 4. Descriptive scheme for the stages of development in perennial forage grasses.

Code	Description	Remarks
Leaf development		
11	First leaf unfolded	Applicable to regrowth of established (plants) and to primary growth of seedlings.
12	2 leaves unfolded	Further subdivision by means of leaf development index (see text).
13	3 leaves unfolded	
•	•••••	
19	9 or more leaves unfolded	
Sheath elongation		
20	No elongated sheath	Denotes first phase of new spring growth after overwintering. This character is used instead of tillering which is difficult to record in established stands.
21	1 elongated sheath	
22	2 elongated sheaths	
23	3 elongated sheaths	
•	•••••	
29	9 or more elongated sheaths	
Tillering (alternative to sheath elongation)		
21	Main shoot only	Applicable to primary growth of seedlings or to single tiller transplants.
22	Main shoot and 1 tiller	
23	Main shoot and 2 tillers	
24	Main shoot and 3 tillers	
•	•••••	
29	Main shoot and 9 or more tillers	
Stem elongation		
31	First node palpable	More precisely an accumulation of nodes. Fertile and sterile tillers distinguishable.
32	Second node palpable	
33	Third node palpable	
34	Fourth node palpable	
35	Fifth node palpable	
37	Flag leaf just visible	
39	Flag leaf ligule/collar just visible	
Booting		
45	Boot swollen	
Inflorescence emergence		
50	Upper 1 to 2 cm of inflorescence visible	
52	¼ of inflorescence emerged	
54	½ of inflorescence emerged	
56	¾ of inflorescence emerged	
58	Base of inflorescence just visible	
Anthesis		
60	Preanthesis	Inflorescence-bearing internode is visible. No anthers are visible.
62	Beginning of anthesis	First anthers appear.
64	Maximum anthesis	Maximum pollen shedding.
66	End of anthesis	No more pollen shedding.
Seed ripening		
75	Endosperm milky	Inflorescence green
85	Endosperm soft doughy	No seeds loosening when inflorescence is hit on palm.
87	Endosperm hard doughy	Inflorescence losing chlorophyll; a few seeds loosening when inflorescence hit on palm
91	Endosperm hard	Inflorescence-bearing internode losing chlorophyll; seeds loosening in quantity when inflorescence hit on palm.
93	Endosperm hard and dry	Final stage of seed development; most seeds shed.

Source: J. Allan Smith and Virgil W. Hayes. 14th International Grasslands Conference Proc. p. 416-418. June 14-24, 1981, Lexington, Kentucky.

Table 5. Dry matter yields, seedling vigor, maturity, and stand persistence of tall fescue varieties sown September 4, 2014, at Lexington, Kentucky.

Variety	Seedling Vigor ¹		Maturity ²		Percent Stand						Yield (tons/acre)			3-year Total				
	Oct 9, 2015		2016		2015		2016		2017		2017							
	May 6	May 2	May 6	May 2	Apr 2	Oct 29	Mar 21	Oct 17	Mar 24	Oct 31	Total	May 4	Jun 26		Oct 27	Total		
Commercial Varieties-Available for Farm Use																		
Jesup MaxQ3	4.1	54.0	55.0	55.5	100	100	100	100	100	100	100	100	100	1.26	1.24	1.06	3.56	10.84*
Drover	3.5	56.5	56.5	57.5	98	97	97	98	99	99	98	99	99	1.27	1.09	0.79	3.14	10.75*
Lacefield MaxQII3	4.4	50.5	52.0	54.0	100	100	100	100	100	100	100	100	100	1.19	1.19	1.05	3.42	10.70*
Select	3.5	53.0	56.0	55.0	98	99	99	99	99	99	98	99	98	1.28	1.28	0.67	3.23	10.59*
Kentucky 32	3.6	55.0	55.5	56.5	99	100	100	100	100	100	100	100	98	1.37	1.39	0.78	3.54	10.35*
KY31+ ³	4.6	46.3	47.5	54.5	100	100	100	100	100	100	100	100	100	1.22	1.44	0.87	3.53	10.26*
Cajun II	4.3	55.5	56.0	56.0	100	100	100	100	100	100	100	100	99	1.18	1.13	1.12	3.44	10.14*
SS-0705TFSL	4.6	52.0	54.5	56.0	100	100	100	100	100	100	100	100	95	1.04	1.33	0.71	3.08	10.14*
BarOptima PLUS E343	3.9	46.3	45.0	53.5	100	99	99	99	99	100	100	100	100	1.39	1.27	1.03	3.69	10.12*
Teton II	4.0	56.0	56.0	57.0	98	99	99	99	99	100	100	100	98	0.92	0.80	1.05	2.77	9.86*
Brutus	4.0	51.5	50.3	53.0	100	100	100	100	100	100	100	100	95	1.06	0.98	0.80	2.85	9.22
Experimental Varieties																		
KYFA1114/AR5843	4.3	47.5	52.0	54.5	100	100	100	100	100	100	100	100	99	1.42	1.28	0.85	3.55	11.31*
KYFA1106	4.8	46.3	52.5	55.0	100	100	100	100	100	100	100	100	99	1.28	1.17	1.14	3.60	11.03*
PPG-FTF-109	4.3	55.5	56.5	56.5	100	100	100	100	100	100	100	100	98	1.21	0.98	1.16	3.35	11.02*
KYFA1103	4.4	53.5	55.5	57.0	100	100	100	100	100	100	100	100	100	1.48	1.18	1.21	3.87	10.92*
NFTF 1044	3.5	51.5	53.5	56.0	100	100	99	99	100	100	100	100	100	1.30	1.30	1.00	3.60	10.85*
PPG-FTF-106	3.9	56.5	57.0	56.0	99	99	99	99	99	99	99	99	98	1.25	1.33	0.73	3.32	10.63*
NFTF1370	3.9	53.5	56.0	56.0	100	100	100	100	100	100	100	100	100	1.40	1.29	0.78	3.47	10.37*
PPG-FTF-105	3.5	56.0	56.0	56.5	98	99	99	99	99	100	100	100	98	1.15	1.15	0.96	3.25	10.37*
KYFA1104	3.9	49.8	52.0	56.0	99	100	99	99	99	99	99	98	98	1.42	1.27	1.05	3.74	10.27*
KYFA1110	4.5	53.5	55.5	56.0	100	100	99	99	99	99	99	94	94	1.12	1.02	0.75	2.89	10.15*
KYFA1108	3.8	47.5	46.3	54.0	100	100	100	100	100	100	100	100	99	1.51	1.26	0.83	3.60	10.09*
KY31- ³	3.9	52.0	54.5	55.5	100	99	99	99	99	99	99	99	99	1.06	1.29	0.87	3.22	9.98*
NFTF1051	4.4	54.5	56.0	55.5	99	99	98	98	98	98	95	95	95	1.27	0.84	0.68	2.80	9.84*
KYFA1113/AR5843	4.8	45.0	53.0	56.0	100	99	99	99	99	99	99	99	99	1.34	1.08	1.05	3.47	9.82*
13SLTF10-3	3.8	46.3	46.8	50.5	100	99	99	99	99	98	95	95	95	0.97	0.94	0.81	2.72	9.67*
GO-12F	4.1	46.3	49.8	52.0	100	100	99	99	99	100	100	100	100	0.94	0.97	0.81	2.72	9.61
BARFAF13131	3.3	49.3	52.0	54.5	96	97	97	97	98	98	96	96	96	1.05	1.12	0.78	2.96	9.33
TFBG13-1	3.8	56.0	56.0	56.0	98	99	98	98	98	98	98	98	98	1.18	0.78	0.73	2.70	9.32
KYFA1115/AR5843	3.5	46.3	48.5	53.5	100	100	100	100	100	100	100	100	99	1.13	1.13	0.88	3.15	9.22
KYFA0905	3.6	47.5	49.3	54.5	98	98	98	99	99	96	96	96	96	1.27	0.98	0.93	3.18	9.14
KYFA1112	3.1	46.8	50.8	53.5	100	100	100	100	100	100	100	100	98	1.12	1.06	0.84	3.02	8.95
KYFA1111	3.4	45.0	49.0	54.0	99	99	99	99	99	99	99	99	91	1.19	0.76	0.68	2.63	8.25
13SLTF10-2	4.0	45.0	46.3	50.5	100	100	99	99	99	98	90	90	90	0.55	0.84	0.63	2.02	8.20
Mean	4.0	50.8	52.6	54.9	99	99	99	99	99	99	97	97	97	1.20	1.12	0.89	3.21	10.04
CV%	14.6	3.9	4.1	2.4	2	1	1	1	1	1	3	3	3	24.53	29.27	30.67	16.91	11.95
LSD _{0.05}	0.8	2.8	3.0	1.8	2	2	2	2	2	2	4	4	4	0.41	0.46	0.38	0.76	1.68

¹ Vigor score based on a 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. See Table 4 for complete scale.

³ KY 31- is the variety KY31 from which the toxic endophyte has been removed. Jesup MaxQ and Lacefield MaxQ II contain a non-toxic endophyte. BarOptima PLUS E34 contains a beneficial endophyte. AR584 is a non-toxic endophyte inserted into the experimental tall fescue varieties. KY31+ contains the toxic endophyte. The other fescue varieties in this test do not contain an endophyte.

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

Description of the Tests

Data from eight studies are reported. Tall fescue varieties were sown at Lexington (2014, 2015, and 2016), Princeton (2015), and Quicksand (2016). The bromegrass trials were sown in Lexington in 2014, 2015, and 2016. The soils at Lexington (Maury), Princeton (Crider), and Quicksand (Nolin) are well-drained silt loams. They are well suited for tall fescue and bromegrass production.

Seedlings were made at the rate of 25 pounds per acre for tall fescue and 20 pounds per acre for bromegrass into a prepared seedbed with a disk drill. Plots were 5 feet by 20 feet in a randomized complete block design with four replications with a harvested plot area of 5 feet by 15 feet. Nitrogen was topdressed at 60 pounds per acre of actual nitrogen in March, after the first cutting, and again in late summer, for a total of 180 pounds per acre over the season. The tests were harvested using a sickle-

Table 6. Dry matter yields, seedling vigor, maturity, and stand persistence of tall fescue varieties sown September 4, 2015, at Lexington, Kentucky.

Variety	Seedling Vigor ¹ Oct 15, 2015	Maturity ²		Percent Stand					Yield (tons/acre)					2-year Total
		2016	2017	2015	2016		2017		2016	2017				
		May 2	May 2	Oct 15	Mar 18	Oct 17	Mar 24	Oct 31	Total	May 8	Jun 26	Oct 26	Total	
Commercial Varieties-Available for Farm Use														
Drover	4.5	56.5	57.5	100	100	100	100	99	5.53	2.11	1.92	1.10	5.13	10.66*
BarOptima PLUS E34 ³	4.5	45.0	52.0	100	100	100	100	98	5.46	2.26	1.42	1.16	4.83	10.29*
HyMark	4.4	54.0	56.5	100	100	100	100	100	5.28	1.81	1.47	0.99	4.26	9.54*
Jesup MaxQ ³	4.6	55.0	55.0	100	100	100	100	95	5.39	1.54	1.51	0.97	4.01	9.41*
Select	4.4	54.5	56.0	100	100	100	100	98	5.49	1.64	1.15	0.83	3.63	9.16*
Cajun II	3.9	56.0	55.5	100	100	100	100	96	4.80	1.92	1.47	0.88	4.26	9.06
SS-0705TFSL	4.8	52.0	56.0	100	100	100	100	98	5.37	1.46	1.29	0.85	3.61	8.97
KY31+ ³	4.6	45.0	52.5	100	100	100	100	100	4.75	1.56	1.53	0.92	4.01	8.75
Lacefield MaxQII ³	5.0	47.5	55.0	100	100	100	100	100	4.61	1.43	1.58	0.88	3.89	8.50
FSG 402TF	4.9	49.8	55.5	100	100	100	100	99	4.67	1.66	1.40	0.73	3.79	8.46
Dominate	4.8	55.0	55.5	100	95	97	99	89	4.28	1.90	1.26	0.97	4.12	8.40
Baguala	4.8	56.0	57.0	100	100	100	97	98	4.48	1.65	1.27	0.89	3.80	8.28
Experimental Varieties														
KYFA1103	4.6	52.8	56.0	100	100	100	100	100	5.79	2.19	1.55	1.11	4.85	10.64*
DLFPS-FTF-89	4.9	56.5	56.5	100	100	100	100	100	5.62	2.25	1.63	0.99	4.86	10.48*
KYFA1113	4.9	51.3	55.5	100	100	100	100	93	5.59	2.06	1.57	1.19	4.83	10.42*
KYFA1104	4.8	49.8	56.0	100	100	100	100	99	5.30	1.68	1.71	0.95	4.33	9.63*
KYFA1102	5.0	55.5	57.5	100	100	100	100	95	5.39	1.91	1.02	1.02	3.96	9.35*
DLFPS-FTF-93	4.1	57.5	57.5	100	100	100	100	94	5.30	1.77	1.40	0.83	4.00	9.30*
KYFA1109	4.3	48.0	54.5	100	100	100	100	100	4.96	1.82	1.71	0.71	4.24	9.20*
DLFPS-FTF-73	4.4	46.3	53.0	100	100	100	100	95	4.74	1.75	1.80	0.91	4.46	9.20*
KY31- ³	4.3	48.5	55.0	100	100	100	100	95	4.89	1.51	1.54	0.95	3.99	8.88
DLFPS-FTF-96	4.4	50.0	53.5	100	100	100	100	100	4.76	1.95	1.27	0.86	4.08	8.84
Drover+E343	4.0	55.5	56.5	100	100	100	100	99	4.57	1.93	1.10	1.20	4.23	8.80
KYFA1311	4.6	49.8	55.5	100	100	100	100	99	4.86	1.45	1.34	0.88	3.68	8.54
KYFA1110	4.6	51.8	56.0	100	100	100	100	96	4.56	1.80	1.36	0.74	3.90	8.46
KYFA9821/AR584 ³	4.8	52.0	54.5	100	100	100	100	98	4.45	1.51	1.35	0.97	3.83	8.28
KYFA1114	4.9	48.8	54.0	100	100	100	100	100	4.39	1.50	1.38	0.88	3.75	8.14
BARFAF13131	3.8	52.0	56.5	100	100	100	100	100	4.03	2.00	1.18	0.66	3.84	7.87
Mean	4.5	51.9	55.4	100	100	100	100	97	4.98	1.79	1.43	0.93	4.15	9.12
CV,%	9.2	4.8	2.2	0	1	1	1	6	14.36	24.86	28.03	33.60	16.48	12.25
LSD,0.05	0.6	3.5	1.7	0	1	1	1	8	1.01	0.62	0.57	0.44	0.96	1.57

¹ Vigor score based on a 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. See Table 4 for complete scale.

³ KY 31- is the variety KY31 from which the toxic endophyte has been removed. Jesup MaxQ and Lacefield MaxQ II contain a non-toxic endophyte. BarOptima PLUS E34 and Drover+E34 contain a beneficial endophyte. AR584 is a non-toxic endophyte inserted into the experimental tall fescue variety. KY31+ contains the toxic endophyte. The other fescue varieties in this test do not contain an endophyte.

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

type forage plot harvester to simulate a spring cut hay/summer grazing/fall stockpile management system. The first cutting was harvested when all tall fescue and bromegrass 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 (P, K, and lime based on regular soil tests), weed control, and harvest timing were in accordance with University of Kentucky recommendations.

Results and Discussion

Weather data for Lexington, Princeton, and Quicksand are presented in tables 1, 2, and 3.

Ratings for maturity (see Table 4 for maturity scale), stand, and dry matter yields (tons/A) are reported in tables 5 through 12. Yields are given by cutting date for 2017 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 13 and 14 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 13 and 14, an open

Table 7. Dry matter yields, seedling vigor, maturity, and stand persistence of tall fescue and meadow fescue (MF) varieties sown September 7, 2016, at Lexington, Kentucky.

Variety	Seedling Vigor ¹ Oct 5, 2016	Maturity ²	Percent Stand				Yield (tons/acre)				
		2017	2016	2017		2017					
		May 3	Oct 5	Mar 14	Oct 31	May 3	Jun 22	Aug 11	Oct 27	Total	
Commercial Varieties-Available for Farm Use											
Tower	2.5	53.5	99	100	100	2.29	1.56	1.22	1.28	6.35*	
KY31+ ³	4.0	52.0	100	100	100	2.39	1.66	1.22	0.97	6.25*	
Teton II	3.8	57.0	100	100	100	1.95	1.59	1.03	1.56	6.13*	
SS0705TFSL	3.9	56.0	100	100	100	2.37	1.66	0.89	1.16	6.08*	
Jesup MaxQ ³	4.8	56.5	100	100	100	2.34	1.52	1.21	0.88	5.95*	
Tower Protek ³	3.0	51.0	99	100	100	2.23	1.68	1.03	1.01	5.95*	
Select	3.9	55.5	100	100	100	2.43	1.65	1.02	0.83	5.93*	
Kora Protek ³	3.5	51.0	100	100	100	1.98	1.45	0.95	1.26	5.64*	
BarOptima PLUS E34 ³	3.1	51.0	100	100	100	2.31	1.49	0.77	0.97	5.54*	
Bronson	3.5	55.5	100	100	100	2.30	1.18	1.05	0.96	5.50*	
Martin2 Protek ³	3.5	57.0	100	100	100	2.33	1.36	0.87	0.92	5.49*	
Lacefield MaxQII ³	4.1	53.0	100	100	100	2.05	1.26	1.04	0.71	5.06	
Cosmonaut (MF)	4.1	50.0	100	100	97	2.30	1.20	0.86	0.70	5.05	
Estancia Arkshield ³	4.1	54.0	100	100	100	2.00	1.19	0.85	0.94	4.98	
Cajun II	4.4	55.5	100	100	100	2.08	1.19	0.76	0.94	4.97	
Payload	3.9	56.0	100	100	100	2.22	1.29	0.70	0.70	4.92	
Experimental Varieties											
KYFA1531	4.5	54.0	100	100	100	2.56	1.81	0.93	1.30	6.59*	
KYFA9611	2.4	52.0	98	99	100	2.13	2.08	0.96	1.20	6.38*	
KYFA1537	4.9	54.5	100	100	100	2.27	1.74	1.18	1.09	6.28*	
TFCB4C2	2.9	55.0	100	100	100	1.94	1.74	1.23	1.16	6.08*	
IS-FTF 70	3.3	53.0	100	100	100	2.43	1.72	0.78	1.07	6.00*	
KYFA9732/AR584 ³	4.4	53.0	100	100	100	2.39	1.54	0.93	1.12	5.98*	
KYFA1533	4.6	54.0	100	100	100	2.32	1.64	0.89	1.11	5.96*	
KYFA9304	4.8	52.0	100	100	100	2.05	1.61	1.24	0.98	5.87*	
KYFA1303	4.6	51.0	100	100	100	2.16	1.77	0.88	1.05	5.86*	
KYFA1536	4.4	55.0	100	100	100	2.64	1.28	0.72	1.17	5.81*	
TFCB5C2	3.8	54.5	100	100	100	2.05	1.66	1.19	0.90	5.79*	
RAD-HAN33	3.1	55.5	100	100	100	2.19	1.50	0.94	1.15	5.78*	
KYFA1534	4.5	56.0	100	100	100	2.48	1.28	0.79	1.22	5.77*	
KYFA1532	4.4	54.5	100	100	100	2.43	1.48	0.75	1.03	5.68*	
KYFA1535	4.6	55.0	100	100	100	2.43	1.33	0.69	1.14	5.59*	
TFCB3C2	3.3	56.5	100	100	100	1.96	1.62	0.79	1.20	5.57*	
TFCB1bC2	3.3	53.5	100	100	100	1.94	1.46	0.98	1.19	5.57*	
TFSoft	3.8	54.5	100	100	100	2.10	1.49	1.06	0.88	5.53*	
KYFA1201	4.1	55.5	100	100	100	2.06	1.44	0.82	1.18	5.49*	
PPG-FTF11	3.1	52.5	100	100	100	2.06	1.51	0.87	0.87	5.30*	
TF0503	4.0	55.0	100	100	100	2.18	1.49	0.96	0.66	5.28*	
RAD-HAN19	3.1	53.0	100	100	100	2.06	1.44	0.67	1.06	5.24	
DLFPS-FTF 93	3.8	57.5	100	100	100	1.89	1.28	1.09	0.98	5.24	
IS-FTF 73	3.1	51.5	100	100	100	2.11	1.37	0.59	1.11	5.19	
IS-FTF 54 Protek ³	3.0	57.5	100	100	100	2.22	1.24	0.71	0.96	5.12	
DLFPS-FTF 96	3.5	53.0	100	100	100	2.11	1.44	0.65	0.87	5.07	
SLTF10-3	3.1	53.5	100	100	100	1.94	1.43	0.87	0.83	5.07	
KY31- ³	4.1	53.5	100	100	100	2.03	1.11	0.94	0.74	4.82	
KYFP0901 (MF)	4.4	50.0	100	100	100	1.88	1.23	0.62	0.52	4.26	
15610912	2.8	52.5	98	98	68	0.57	0.41	0.64	0.64	2.26	
Mean	3.8	54.0	99	100	99	2.16	1.46	0.91	1.00	5.53	
CV,%	12.9	3.2	1	0	4	21.48	24.42	32.73	31.61	17.22	
LSD,0.05	0.7	2.4	1	1	6	0.65	0.50	0.42	0.44	1.33	

¹ Vigor score based on a 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. See Table 4 for complete scale.

³ KY 31- is the variety KY31 from which the toxic endophyte has been removed. Jesup MaxQ, Lacefield MaxQ II, Tower Protek, Kora Protek, Martin2 Protek, IS-FTF 54 Protek and Estancia Arkshield contain a non-toxic endophyte. BarOptima PLUS E34 contains a beneficial endophyte. AR584 is a non-toxic endophyte inserted into the experimental tall fescue variety. KY31+ contains the toxic endophyte. The other fescue varieties in this test do not contain an endophyte.

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

Table 8. Dry matter yields, seedling vigor, maturity, and stand persistence of tall fescue varieties sown August 25, 2015, at Princeton, Kentucky.

Variety	Seedling Vigor ¹ Oct 15, 2015	Maturity ²		Percent Stand					Yield (tons/acre)					2-year Total	
		2016	2017	2015	2016		2017		2016	2017					
		May 4	May 9	Oct 15	Mar 22	Nov 2	Mar 16	Oct 25	Total	May 9	Jun 12	Oct 25	Total		
Commercial Varieties-Available for Farm Use															
Lacefield Max QII ³	4.4	56.0	55.5	100	100	100	100	100	100	7.83	1.52	1.12	0.70	3.35	11.18*
Cajun II	4.1	58.0	58.5	100	100	100	100	100	100	7.24	1.71	1.25	0.89	3.85	11.09*
HyMark	2.9	57.5	58.5	100	100	100	100	100	100	7.46	1.78	0.90	0.84	3.53	10.99*
Bronson	3.0	57.0	58.5	100	100	100	100	100	100	7.32	1.90	0.85	0.88	3.64	10.95*
FSG402TF	3.6	55.5	57.5	100	100	100	100	100	100	7.40	1.76	1.23	0.50	3.50	10.90*
SS-0705TFSL	3.3	57.0	58.0	100	100	100	100	100	100	7.56	1.60	0.80	0.89	3.29	10.85*
Select	3.6	57.0	58.0	100	100	100	100	100	100	7.15	1.72	0.98	0.70	3.39	10.54*
Dominate	4.0	58.0	60.0	100	100	100	100	100	100	7.08	1.77	1.09	0.56	3.43	10.50*
Jesup MaxQ ³	2.5	58.0	58.5	100	100	100	100	100	100	7.06	1.51	1.10	0.74	3.35	10.40*
Baguala	2.9	57.5	59.5	100	100	100	100	100	100	6.61	1.53	1.22	0.87	3.62	10.24*
BarOptima PLUS E34 ³	2.6	54.0	54.0	100	100	100	100	100	100	6.79	1.56	1.18	0.69	3.44	10.22*
KY31+ ³	3.1	55.0	56.0	100	100	100	100	100	100	6.74	1.22	1.15	0.62	2.99	9.74
Experimental Varieties															
KYFA1311	3.1	55.5	56.0	100	100	100	100	100	100	7.36	1.52	1.34	1.17	4.03	11.39*
KYFA1113	4.0	56.0	56.5	100	100	100	100	100	100	7.56	1.68	1.00	1.01	3.69	11.25*
KYFA1104	4.3	56.0	56.0	100	100	100	100	100	100	7.76	1.38	1.03	0.92	3.33	11.09*
DLFPS-FTF-73	3.0	54.0	55.5	100	100	100	100	100	100	7.09	1.69	1.25	1.00	3.94	11.03*
KYFA1103	4.4	56.0	58.0	100	100	100	100	100	100	7.18	1.64	1.02	1.14	3.80	11.00
KYFA1114	4.3	55.0	56.0	100	100	100	100	100	100	7.49	1.65	0.90	0.85	3.41	10.90*
DLFPS-FTF-89	3.6	57.0	57.0	100	100	100	100	100	100	7.38	1.68	0.91	0.73	3.32	10.70*
KYFA1102	4.6	57.5	58.5	100	100	100	100	100	100	7.26	1.66	0.86	0.69	3.20	10.46*
KYFA1109	3.9	55.5	56.0	100	100	100	100	100	100	7.25	1.19	1.19	0.72	3.10	10.35*
KY31- ³	3.4	56.0	57.5	100	100	100	100	100	100	6.91	1.65	1.10	0.66	3.41	10.32*
KYFA1110	3.5	56.0	58.0	100	100	100	100	100	100	7.08	1.56	0.90	0.65	3.12	10.20*
DLFPS-FTF-96	3.3	55.5	55.5	100	100	100	100	100	100	6.81	1.50	1.11	0.72	3.32	10.13*
KYFA9821/AR584 ³	4.6	56.0	57.5	100	100	100	100	100	100	6.85	1.48	1.10	0.58	3.16	10.01
DLFPS-FTF-93	2.5	58.0	59.5	100	100	100	100	100	100	6.44	1.31	1.12	0.72	3.15	9.59
Mean	3.6	56.3	57.3	100	100	100	100	100	100	7.18	1.58	1.07	0.79	3.44	10.62
CV,%	21.4	1.6	1.9	0	0	0	0	0	0	8.71	18.19	23.14	45.58	16.10	8.94
LSD,0.05	1.1	1.3	1.5	1	0	0	0	0	0	0.88	0.41	0.35	0.51	0.78	1.34

¹ Vigor score based on a 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. See Table 4 for complete scale.

³ KY 31- is the variety KY31 from which the toxic endophyte has been removed. Jesup MaxQ and Lacefield MaxQ II contain a non-toxic endophyte. BarOptima PLUS E34 contains a beneficial endophyte. AR584 is a non-toxic endophyte inserted into the experimental tall fescue variety. KY31+ contains the toxic endophyte. The other fescue varieties in this test do not contain an endophyte.

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

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 based on

the 0.05 LSD. 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 bromegrass varieties (tables 5-12).

Table 11. Dry matter yields, seedling vigor, maturity, and stand persistence of bromegrass varieties sown September 4, 2015, at Lexington, Kentucky.

Variety	Type	Seedling Vigor ¹ Oct 15, 2015	Maturity ²			Percent Stand					Yield (tons/acre)					2-year Total	
			2016	2017	2015	2016		2017		2016	2017						
			May 3	Jun 14	May 2	Oct 15	Mar 18	Oct 17	Mar 24	Oct 31	Total	May 3	Jun 21	Aug 11	Oct 24		Total
Commercial Varieties-Available for Farm Use																	
MacBeth	meadow	5.0	56.0	58.5	58.0	100	100	100	100	100	5.61	1.51	0.95	0.89	0.39	3.74	9.35*
Peak	smooth	4.8	51.5	29.0	49.3	99	99	98	97	97	4.94	1.03	1.04	1.03	0.27	3.37	8.31*
Experimental Varieties																	
GO-13SBF	smooth	3.5	52.5	54.0	53.3	96	96	96	94	94	4.50	0.85	1.16	0.81	0.23	3.05	7.56
Mean		4.4	53.5	47.2	53.5	98	98	98	98	97	5.02	1.13	1.05	0.91	0.30	3.39	8.40
CV,%		11.3	2.9	4.8	5.2	2	2	3	4	4	9.79	19.99	24.15	43.91	23.58	16.25	9.98
LSD,0.05		0.9	2.6	4.0	4.9	3	3	6	7	7	0.85	0.39	0.44	0.69	0.12	0.95	1.45

¹ Vigor score based on a 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. See Table 4 for complete scale.

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

Table 9. Dry matter yields, seedling vigor, and stand persistence of tall fescue varieties sown September 2, 2016, at Quicksand, Kentucky.

Variety	Seedling Vigor ¹ Nov 3, 2016	Percent Stand			Yield (tons/acre)				
		2016		2017	2017				
		Nov 3	Mar 24	Nov 8	Apr 23	Jun 23	Sep 22	Oct 31	Total
Commercial Varieties-Available for Farm Use									
BarOptima PLUS E34 ²	4.9	100	100	100	2.24	2.40	1.80	0.46	6.90*
Jesup MaxQ ²	4.1	99	99	99	2.31	2.27	1.97	0.33	6.88*
Martin2 Protek ²	4.1	98	98	98	2.23	2.22	1.72	0.48	6.65*
SS0705TFSL	2.4	95	95	95	1.03	2.53	2.23	0.45	6.25*
Payload	4.0	98	98	98	1.78	2.28	1.75	0.38	6.19*
Estancia Arkshield ²	4.4	100	100	100	1.64	2.04	2.11	0.36	6.14*
Cajun II	3.0	97	96	97	1.74	1.77	2.16	0.32	5.99*
KY31+ ²	3.3	98	97	98	1.44	2.17	1.77	0.49	5.87*
Lacefield MaxQII ²	4.3	100	100	100	1.53	2.06	1.71	0.36	5.67*
Kora Protek ²	4.4	100	100	100	1.52	2.04	1.71	0.30	5.57*
Tower	2.0	91	90	94	1.29	2.38	1.53	0.35	5.54*
Teton II	3.3	99	98	98	1.43	1.82	1.85	0.33	5.44*
Select	2.8	96	96	96	1.12	2.04	1.55	0.42	5.12
Tower Protek ²	2.8	99	96	98	1.03	1.85	1.84	0.38	5.09
Experimental Varieties									
TF0503	3.6	98	97	98	1.54	2.59	1.99	0.50	6.62*
KY31- ²	3.5	98	97	98	1.27	2.27	1.89	0.51	5.94*
SLTF10-3	3.5	97	96	96	1.10	2.02	1.67	0.24	5.02
PPG-FTF112	2.6	90	89	91	0.96	2.02	1.70	0.33	5.01
Mean	3.5	97	97	97	1.51	2.15	1.83	0.39	5.88
CV,%	28.0	3	4	3	39.28	17.81	21.01	45.84	18.01
LSD,0.05	1.4	4	5	4	0.84	0.54	0.55	0.25	1.50

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

² KY 31- is the variety KY31 from which the toxic endophyte has been removed. Jesup MaxQ, Lacefield MaxQ II, Tower Protek, Kora Protek, Martin2 Protek and Estancia Arkshield contain a non-toxic endophyte. BarOptima PLUS E34 contains a beneficial endophyte. KY31+ contains the toxic endophyte. The other fescue varieties in this test do not contain an endophyte.

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

Tables 15 and 16 are summaries of yield data from 2000 to 2017 for tall fescue and from 2006 to 2017 for bromegrass 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 table 15 and 16 summaries, 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 the information can be found in the yearly reports. See the footnotes in tables 15 and 16 to determine the yearly report that should be referenced.

Table 10. Dry matter yields, seedling vigor, maturity, and stand persistence of bromegrass varieties sown September 5, 2014, at Lexington, Kentucky.

Variety	Type	Seedling Vigor ¹ Oct 9, 2014	Maturity ²						Percent Stand						Yield (tons/acre)												
			2015		2016		2017		2015		2016		2017		2015		2016		2017		3-year Total						
			May 6	May 11	Jun 14	Jun 14	May 2	May 2	Oct 9	Oct 9	Apr 2	Apr 2	Oct 29	Oct 29	Mar 21	Mar 21	Oct 31	Oct 31	Mar 2	Mar 2	May 2	May 2	Jun 21	Jun 21	Oct 24	Oct 24	Total
Commercial Varieties-Available for Farm Use																											
MacBeth	meadow	4.8	56.0	58.0	59.0	58.0	58.0	81	89	89	85	85	84	79	76	3.39	2.40	2.40	2.40	1.20	0.64	0.24	2.08	2.08	7.87*		
Carlton	smooth	4.0	29.0	52.5	59.5	53.5	53.5	85	70	77	76	74	53	55	55	2.59	2.48	2.48	2.48	0.42	0.54	0.36	1.32	1.32	6.40		
AC Knowles	hybrid	4.3	48.5	55.5	60.0	55.5	55.5	93	88	88	89	87	75	70	68	2.40	1.95	1.95	1.95	0.53	0.77	0.33	1.63	1.63	5.99		
Experimental Varieties																											
BARBcFRRL	meadow	4.8	57.0	58.0	29.0	58.0	95	94	94	94	90	85	81	80	80	3.25	2.87	2.87	2.87	0.92	0.97	0.29	2.18	2.18	8.30*		
MSB	-	4.8	46.3	54.0	29.0	51.8	94	89	89	91	91	84	80	70	70	3.10	2.48	2.48	2.48	1.29	0.90	0.35	2.54	2.54	8.11*		
GO-13SBF	smooth	4.3	51.5	55.5	59.0	53.5	82	82	82	84	84	79	65	63	63	2.95	1.81	1.81	1.81	0.57	0.44	0.15	1.16	1.16	5.92		
Mean		4.5	48.0	55.6	49.3	55.0	88	86	86	87	86	80	71	69	69	2.95	2.33	2.33	2.33	0.82	0.71	0.29	1.82	1.82	7.10		
CV,%		15.0	4.5	2.2	1.5	4.7	13	13	13	11	12	12	16	19	19	16.26	26.71	26.71	26.71	31.97	38.26	51.00	25.27	25.27	16.37		
LSD,0.05		1.0	3.3	1.8	1.1	3.9	17	17	17	14	15	15	17	20	20	0.72	0.94	0.94	0.94	0.46	0.41	0.22	0.69	0.69	1.75		

¹ Vigor score based on a 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. See Table 4 for complete scale.

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

Table 12. Dry matter yields, seedling vigor, maturity, and stand persistence of bromegrass varieties sown September 8, 2016, at Lexington, Kentucky.

Variety	Type	Seedling Vigor ¹ Oct 5, 2016	Maturity ²	Percent Stand				Yield (tons/acre)				
			2017	2016	2017		2017					
			Apr 20	Oct 5	Mar 15	Oct 31	Apr 20	May 18	Jun 23	Aug 11	Oct 24	Total
Commercial Varieties-Available for Farm Use												
MacBeth	meadow	4.1	56.0	97	99	99	2.36	0.98	0.97	0.70	0.74	5.75*
Admiral	meadow	4.6	56.0	97	98	98	2.03	0.89	1.00	1.06	0.75	5.73*
ARID	smooth	3.8	48.5	81	94	96	1.75	1.09	0.98	0.63	0.52	4.98*
Peak	smooth	3.4	45.0	93	92	93	1.60	1.11	0.89	0.65	0.63	4.87
Mean		4.0	51.4	98.0	96	96	1.94	1.02	0.96	0.76	0.66	5.33
CV,%		20.6	4.2	4.0	2	2	6.63	26.84	23.56	31.13	18.94	10.19
LSD,0.05		1.3	3.5	6.0	4	3	0.21	0.44	0.36	0.38	0.20	0.87

¹ Vigor score based on a 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. See Table 4 for complete scale.

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

Table 13. Performance of tall fescue varieties across years and locations in Kentucky.

Variety	Proprietor/KY Distributor	Lexington						Princeton		Quicksand	
		2014 ¹	2015	2016	2017	2018	2019	2015	2016	2017	2018
Commercial Varieties-Available for Farm Use											
Baguala	Allied Seed	*	*	X ³	*	*	*	X	*	*	*
BarOptima PLUS E34	Barenbrug USA	*	*	*	*	*	*	X	*	*	*
Bronson	Ampac Seed	*	*	*	*	*	*	X	*	*	*
Brutus	Saddle Butte Ag. Inc.	*	X	*	*	*	*	*	*	*	*
Cajun II	Smith Seed Services	X	*	*	*	*	*	*	*	*	*
Dominate	Allied Seed	*	*	X	*	*	*	*	*	*	*
Drover	Barenbrug USA	*	*	*	*	*	*	*	*	*	*
Estancia Arkshield ⁴	Mountain View Seeds	*	*	*	*	*	*	*	*	*	*
FSG 402TF	Farm Science Genetics	*	X	X	*	*	*	*	*	*	*
Hymark	Fraser Seed	*	*	*	*	*	*	*	*	*	*
Kentucky 32	Oregro Seeds	*	*	*	*	*	*	*	*	*	*
Kora Protek ⁴	DLF-Pickseed	*	*	*	*	*	*	*	*	*	*
KY31+4	Ky Agric. Exp. Station/Public	*	*	X	*	*	*	X	*	X	*
Jesup MaxQ ⁴	Pennington Seed	*	*	*	*	*	*	*	*	*	*
Lacefield MaxQ II ⁴	Pennington Seed	*	*	X	*	*	*	*	*	*	*
Martin 2 Protek ⁴	DLF-Pickseed	*	*	*	*	*	*	*	*	*	*
Payload	Brett Young	*	*	*	*	*	*	*	*	*	*
Select	Southern States	*	*	*	*	*	*	*	*	*	X
SS-0705TFSL	Southern States	*	*	*	*	*	*	*	*	*	*
Teton II	Mountain View Seeds	*	*	X	*	*	*	*	*	*	*
Tower	DLF-Pickseed	*	*	*	*	*	*	*	*	*	*
Tower Protek ⁴	DLF-Pickseed	*	*	*	*	*	*	*	*	*	X
Experimental Varieties											
BARFAF13131	Barenbrug USA	*	*	X	*	*	*	*	*	*	*
DLFPS-FTF-73	DLF-Pickseed	*	*	X	*	*	*	*	*	*	*
DLFPS-FTF-89	DLF-Pickseed	*	*	*	*	*	*	*	*	*	*
DLFPS-FTF-93	DLF-Pickseed	*	*	*	*	*	*	X	X	X	*
DLFPS-FTF-96	DLF-Pickseed	*	*	X	*	*	*	X	X	X	*
Drover+E34	Barenbrug USA	*	*	X	*	*	*	*	*	*	*
GO-12F	Grassland Oregon	*	*	X	*	*	*	*	*	*	*
IS-FTF 54 Protek ⁴	DLF-Pickseed	*	*	*	*	*	*	X	*	*	*
IS-FTF 70	DLF-Pickseed	*	*	*	*	*	*	*	*	*	*
IS-FTF 73	DLF-Pickseed	*	*	*	*	*	*	X	*	*	*
KY31-4	KY Agric. Exp. Station	*	*	*	*	*	*	X	*	*	*
KYFA0905	KY Agric. Exp. Station	X	X	*	*	*	*	X	*	*	*
KYFA1102	KY Agric. Exp. Station	*	*	*	*	*	*	*	*	X	*
KYFA1103	KY Agric. Exp. Station	*	*	*	*	*	*	*	*	*	*
KYFA1104	KY Agric. Exp. Station	*	X	*	*	*	*	*	*	*	*
KYFA1106	KY Agric. Exp. Station	*	*	*	*	*	*	*	*	*	*
KYFA1108	KY Agric. Exp. Station	*	*	*	*	*	*	*	*	*	*
KYFA1109	KY Agric. Exp. Station	*	*	*	*	*	*	*	*	*	*
KYFA1110	KY Agric. Exp. Station	*	*	*	*	*	*	*	*	*	X
KYFA1111	KY Agric. Exp. Station	X	X	X	X	X	X	X	X	X	X
KYFA1112	KY Agric. Exp. Station	X	X	X	X	X	X	X	X	X	X

continued

Table 14. Performance of bromegrass varieties across years at Lexington, Kentucky.

Variety	Type	Proprietor/KY Distributor	2014 ¹			2015		2016
			2015 ²	2016	2017	2016	2017	2017
Commercial Varieties-Available for Farm Use								
AC Knowles	hybrid	Agriculture Canada	x ³	*	*			
Admiral	meadow	Cisco Seeds						*
ARID	smooth	Mountain View Seeds						*
Carlton	smooth	Pickseed USA	x	*	x			
MacBeth	meadow	Cisco Seeds	*	*	*	*	*	*
Peak	smooth	Allied Seed				*	*	x
Experimental Varieties								
BAR BcF1FRRL	meadow	Barenbrug USA	*	*	*			
GO-135BF	smooth	Grassland Oregon	*	x	x	x	*	
MSB	–	Pickseed USA	*	*	*			

¹ Establishment year.

² Harvest year.

³ "x" in the box indicates the variety was in the test but yielded significantly less than the top yielding variety in the test. Open boxes indicate the variety was not in the test.

*Not significantly different from the highest yielding variety in the test.

Table 13. continued

Variety	Proprietor/KY Distributor	Lexington						Princeton		Quicksand	
		2014 ¹		2015		2016		2015		2016	
		15 ²	16	17	16	17	17	16	17	16	17
KYFA1113	KY Agric. Exp. Station			*	*	*			*	*	
KYFA1113/AR584 ⁴	KY Agric. Exp. Station	*	x	*					*	*	
KYFA1114	KY Agric. Exp. Station				x	x			*	*	
KYFA1114/AR584 ⁴	KY Agric. Exp. Station	*	*	*							
KYFA1115/AR584 ⁴	KY Agric. Exp. Station	x	*	*							
KYFA1201	KY Agric. Exp. Station						*				
KYFA1303	KY Agric. Exp. Station						*				
KYFA1311	KY Agric. Exp. Station				*	x			*	*	
KYFA1531	KY Agric. Exp. Station						*				
KYFA1532	KY Agric. Exp. Station						*				
KYFA1533	KY Agric. Exp. Station						*				
KYFA1534	KY Agric. Exp. Station						*				
KYFA1535	KY Agric. Exp. Station						*				
KYFA1536	KY Agric. Exp. Station						*				
KYFA1537	KY Agric. Exp. Station						*				
KYFA9304	KY Agric. Exp. Station						*				
KYFA9611	KY Agric. Exp. Station						*				
KYFA9732/AR584 ⁴	KY Agric. Exp. Station						*				
KYFA9821/AR584 ⁴	KY Agric. Exp. Station				x	x		x	x	x	
NFTF 1044	Noble Foundation	*	*	*							
NFTF 1051	Noble Foundation	*	*	x							
NFTF 1370	Noble Foundation	*	*	*							
PPG-FTF-105	Mountain View Seeds	*	*	*							
PPG-FTF-106	Mountain View Seeds	*	*	*							
PPG-FTF-109	Mountain View Seeds	*	*	*							
PPG-FTF 112	Mountain View Seeds						*				x
RAD-HAN19	Radix Research						x				
RAD-HAN33	Radix Research						*				
SLTF-10-3	Oregro Seeds						x				
TFCB13-1	Oregro Seeds	*	*	x							
TFCB1bC2	USDA-ARS						*				
TFCB3C2	USDA-ARS						*				
TFCB4C2	USDA-ARS						*				
TFCB5C2	USDA-ARS						*				
TF Soft	USDA-ARS						*				
TF0503	USDA-ARS						*				*
13SLTF10-2	Oregro Seeds	*	x	x							
13SLTF10-3	Oregro Seeds	*	*	x							

¹ Establishment year.

² Harvest year.

³ "x" in the box indicates the variety was in the test but yielded significantly less than the top yielding variety in the test.

Open boxes indicate the variety was not in the test.

⁴ KY31- is the variety KY31 from which the toxic endophyte has been removed. KY31+ contains the toxic endophyte. Jesup MaxQ, Lacefield MaxQ II, Tower Protek, Kora Protek, Martin2, Protek, IS-FTF 54 Protek and Estancia Arkshield contain a non-toxic endophyte. BarOptima PLUS E34 contains a beneficial endophyte. AR584 is a non-toxic endophyte inserted into the experimental tall fescue varieties. The other varieties do not contain an endophyte.

*Not significantly different from the highest yielding variety in the test.

Summary

Selecting a good variety of tall fescue and bromegrass 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 are listed in the “Publications” section of the UK Forage website, www.uky.edu/Ag/Forage:

- Lime and Fertilizer Recommendations (AGR-1)
- Grain and Forage Crop Guide for Kentucky (AGR-18)
- Tall Fescue (AGR-59)
- Establishing Forage Crops (AGR-64)
- Tall Fescue in Kentucky (AGR-108)
- Forage Identification and Use Guide (AGR-175)
- Rotational Grazing (ID-143)

About the Authors

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Table 15. Summary of Kentucky tall fescue yield trials 2000-2017 (yield shown as a percentage of the mean of the commercial varieties in the trial).

Variety	Proprietor	Lexington						Princeton						Quicksand				Mean ³ (#trials)							
		01 ^{1,2} 3-yr ⁴	03	05	07	09	11	12	13	14	15	00	02	04	06	08	10		12	15	01	03	05	13	
Atlas Select	ProSeeds Marketing																								
Aprilia	ProSeeds Marketing																								
Baquala	Allied Seed																								
BarElite	Barenbrug USA				96																				94(2)
Barlane	Barenbrug USA		87	99						100															95(3)
Barolex	Barenbrug USA			90																					94(3)
BarOptima PLUS E34 ⁵	Barenbrug USA			122	99																				
Bronson	Ampac Seed			88	97	105	102	99	99																
Brutus	Saddle Butte Ag. Inc.																								
Bull	Improved Forages			98	102																				
Cajun II	Smith Seed Services																								
Carmine	DLF International	99								97															
Cowgirl	Rose-Agriseeds																								
Dominate	Allied Seed																								
Drover	Barenbrug USA																								
DuraMax GOLD5	DLF International																								
Enhance	Allied Seed																								
Estancia ArkShield ⁵	Mountain View Seeds																								
Festival	Pickseed West	107																							
Flourish	Allied Seed																								
FG 4021F	Farm Science Genetics																								
Goliath	Ampac Seed																								
Hoedown	DLF International	104																							
HyMark	Fraser Seeds																								
Jesup EF	Pennington Seed																								
Jesup MaxQ ⁵	Pennington Seed			98	101	110	103	100	93	105															
Johnstone	ProSeeds Marketing	108																							
KENHY	KY Agric Exp Sta.																								
Kentucky 32	Oregro Seeds																								
Kokanee	Ampac Seed	89																							

continued

Table 15. continued

Variety	Proprietor	Lexington										Princeton										Quicksand			Mean ³ (#trials)				
		01 ^{1,2} 3-yr ⁴	03	05	07	09	11	12	13	14	15	00	02	04	06	08	10	12	15	01	03	05	13						
KY31+ ⁵	KY Agric Exp Sta.	118	112	108	102	102	93	95	103	100	96	100	96	104	104	104	104	104	104	104	104	104	104	104	104	110	110	110	104(21)
Lacefield MaxQ II ⁵	Pennington Seed				109																								104(8)
Maximize	Turf Seed	95																											97(4)
Martin2 Protek ⁵	DLF International						104																						-
Namyo	Jap. Grassland ForageSeed/				96																								-
Noria	ProSeeds Marketing				98																								-
RAD-ERF50	Radix Research, Inc.																												-
Resolute	Ampac Seed	90																											-
Savory	DLF International																												-
Seine	Advanta Seeds																												-
Select	Southern States	106	94	99	99	98	90	100	97	103	100	105	105	105	102	105	100	99	100	99	112	102	91					100(22)	
SS-0705TFSL	Southern States																												100(3)
Stockman	Seed Research of OR																												103(4)
Teton II	Mountain View Seeds		108																										103(4)
Texoma MaxQ II ⁵	Pennington Seed				95																								-
TF0203G	Seed Research of OR																												-
Tower Protek ⁵	DLF International																												-
Tuscany	Forage Genetics	112																											-
Tuscany II	Seed Research of OR																												-
5CAN	Brett Young						86																						100(3)

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 2012 was harvested two years, so the final report would be "2015 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.

5 KY31+ contains the toxic endophyte. Jesup MaxQ, Texoma MaxQ II, Lacefield MaxQ II, DuraMax GOLD, Martin2 Protek, Tower Protek and Estancia Arkshield contain a non-toxic endophyte. BarOptima PLUS E34 contains a beneficial endophyte. The other fescue varieties in this table do not contain an endophyte.

Table 16. Summary of Kentucky bromegrass yield trials at Lexington 2006-2017 (yield shown as a percentage of the mean of the commercial varieties in the trial.)

Variety	Type	Proprietor/KY Distributor	2006 ^{1,2}	2008	2010	2012	2014	2015	Mean ³ (#trials)
			4-yr ⁴	3-yr	3-yr	3-yr	3-yr	2-yr	
AC Knowles	hybrid	Agriculture Canada	85		82	102	89		89(4)
Bigfoot	hybrid	Grassland Oregon	108	116	105				110(3)
Canterbury	mountain	Barenbrug USA		79					–
Carlton	smooth	Pickseed USA				82	95		91(2)
Doina	smooth	Barenbrug USA		114	108				111(2)
Fleet	meadow	Agriculture Canada	110			109			110(2)
Hakari	Alaska	Barenbrug USA		85	85				85(2)
MacBeth	meadow	Cisco Seeds		136	119	107	116	106	117(5)
Olga	smooth	Barenbrug USA		116	101				109(2)
Peak	smooth	Allied Seed		97		100		94	97(3)
Persister	prairie	DLF International		72					–
RAD-BI29	smooth	Columbia Seeds	96	86					91(2)

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 2012 was harvested three years, so the final report would be “2015 Tall Fescue and Brome 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.