



2016 Tall Fescue and Bromegrass Report

G.L. Olson, S.R. Smith, T.D. Phillips, Plant and Soil Sciences

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.

Table 1. Temperature and rainfall at Lexington, Kentucky, in 2013, 2014, 2015, and 2016.

	2013				2014				2015				2016 ²			
	Temp		Rainfall		Temp		Rainfall		Temp		Rainfall		Temp		Rainfall	
	°F	DEP ¹	IN	DEP	°F	DEP	IN	DEP	°F	DEP	IN	DEP	°F	DEP	IN	DEP
JAN	38	+7	4.50	+1.64	25	-6	2.28	-0.58	32	+1	2.17	-0.69	32	+1	0.80	-2.06
FEB	36	+1	1.78	-1.43	30	-5	5.47	+2.26	26	14	3.08	-0.13	38	+3	6.09	+2.88
MAR	39	-5	5.47	+1.07	39	-5	3.08	-1.32	45	+1	7.34	+2.94	52	+8	4.07	-0.33
APR	55	0	4.46	+0.58	58	+3	5.27	-1.89	57	+2	13.19	+9.31	57	+2	3.97	+0.09
MAY	65	+1	5.23	+0.76	66	+2	5.72	+1.25	69	+5	3.02	-1.45	64	0	9.17	+4.70
JUN	72	0	7.32	+3.66	75	+3	2.93	-0.73	75	+3	8.20	+4.54	76	+4	5.09	+1.43
JUL	72	-4	9.33	+4.33	74	-2	3.18	-1.82	77	+1	10.22	+5.22	79	+3	7.43	+2.43
AUG	72	-3	3.68	-0.25	76	+1	6.53	+2.60	74	-1	3.49	-0.44	79	+4	4.37	+0.44
SEP	67	-1	2.21	-0.99	69	+1	3.63	+0.43	72	+4	3.49	+0.29	74	+6	2.18	-1.02
OCT	55	-2	7.02	+4.45	57	0	5.55	+2.98	59	+2	2.78	+0.21	64	+7	0.37	-2.20
NOV	41	-4	3.06	-0.33	41	-4	2.79	-0.60	51	+6	3.72	+0.33				
DEC	36	0	4.19	+0.21	40	+4	2.47	-1.51	49	+13	8.42	+4.44				
Total							49.4	+4.85			69.12	+24.57			46.54	+6.36

¹ DEP is departure from the long-term average.

² 2016 data is for ten months through October.

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

	2015				2016 ²			
	Temp		Rainfall		Temp		Rainfall	
	°F	DEP ¹	IN	DEP	°F	DEP	IN	DEP
JAN	34	0	1.51	-2.29	35	+1	1.37	-2.43
FEB	28	-10	4.16	-0.27	40	+2	4.23	-0.20
MAR	46	-1	6.83	+1.89	53	+6	7.3	+2.36
APR	60	+1	7.38	+2.58	59	0	4.41	-0.39
MAY	68	+1	3.52	-1.44	64	-3	6.21	+1.25
JUN	76	+1	2.85	-1.00	77	+2	2.18	-1.67
JUL	79	+1	8.83	+4.54	80	+2	12.72	+8.43
AUG	73	-4	2.90	-1.11	78	+2	5.37	+1.36
SEP	71	0	0.82	-2.51	73	+2	1.33	-2.00
OCT	60	+1	4.15	+1.10	65	+6	0.25	-2.80
NOV	53	+6	5.95	+1.32				
DEC	49	+10	6.37	+1.33				
Total			55.27	+4.14			45.37	+3.91

¹ DEP is departure from the long-term average.

² 2016 data is for the ten months through October.

Table 3. Temperature and rainfall at Quicksand, Kentucky, in 2014, 2015, and 2016.

	2014				2015				2016 ²			
	Temp		Rainfall		Temp		Rainfall		Temp		Rainfall	
	°F	DEP ¹	IN	DEP	°F	DEP	IN	DEP	°F	DEP	IN	DEP
JAN	29	-2	2.66	-0.63	33	+2	1.89	-1.40	32	+1	2.76	-0.53
FEB	36	+3	4.52	+0.92	27	-6	3.67	+0.07	40	+7	6.06	+2.46
MAR	43	+2	5.68	+1.34	46	+5	6.51	+2.17	51	+10	2.16	-2.18
APR	58	+5	5.12	+1.02	57	+4	9.51	+5.41	57	+4	3.53	-0.57
MAY	65	+3	2.71	-1.77	67	+5	2.54	-1.94	63	+1	8.04	+3.56
JUN	75	+5	1.81	-2.01	74	+4	3.06	-0.76	73	+3	5.51	+1.69
JUL	72	-2	7.14	+1.89	76	+2	7.91	+2.66	78	+4	6.52	+1.27
AUG	74	+1	7.94	+3.93	73	0	3.48	-0.53	78	+5	5.59	+1.58
SEP	69	+3	1.93	-1.59	70	+4	2.05	-1.47	72	+6	1.05	-2.47
OCT	57	+3	6.36	+3.45	57	+3	2.51	-0.40	62	+8	1.01	-1.90
NOV	41	-1	3.10	-0.78	50	+8	2.25	-1.63				
DEC	41	+8	2.41	-1.73	49	+16	4.72	+0.58				
Total			51.38	+4.04			50.10	+2.76			42.23	+2.91

¹ DEP is departure from the long-term average.

² 2016 data is for the ten months through October.

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 brome grasses are susceptible to winterkill. Mountain brome grass (*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-branched root system give protection on erodible slopes. It is similar to California brome grass (*Bromus carinatus*), and some consider them to be synonymous.

All 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.

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 14 and 15 show a summary of all tall fescue and brome grass varieties tested in Kentucky for the past 15 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 "Continental" types according to the area from which the parental material for the variety originated. In general, the Mediterranean

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.

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.

Description of the Tests

Data from seven studies are reported. Tall fescue varieties were sown at Lexington (2013, 2014 and 2015), Princeton (2015), and Quicksand (2013). The bromegrass trials were sown in Lexington in 2014 and 2015. 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.

Seedings 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-type forage plot harvester to simulate a spring cut hay/summer grazing/fall stockpile

Table 5. Dry matter yields, seedling vigor, maturity, and stand persistence of tall fescue varieties sown September 5, 2013, at Lexington, Kentucky.

Variety	Seedling Vigor ¹		Maturity ²		Percent Stand						Yield (tons/acre)						3-year Total			
	Oct 14, 2013		2014		2015		2016		2017		2018		2019		2020			Total		
	Oct 14, 2013	May 11	May 11	May 11	May 11	May 11	May 11	May 11	May 11	May 11	May 11	May 11	May 11	May 11	May 11	May 11				
Commercial Varieties-Available for Farm Use																				
Cajun II	3.0	55.0	56.0	57.0	96	92	92	92	92	92	92	92	92	92	92	92	92	92	2.58	8.94*
Goliath	3.4	56.0	56.0	56.0	99	97	97	97	97	97	97	97	97	97	97	97	97	97	2.22	8.85*
KY31+ ³	4.3	49.8	53.0	54.5	100	100	100	100	100	100	100	100	100	100	100	100	100	100	2.16	8.75*
BarOptima PLUS E34 ³	3.4	48.0	50.5	52.5	100	97	99	99	99	99	99	99	99	99	99	99	99	99	2.16	8.66*
Bronson	3.5	55.5	55.5	56.0	100	95	95	96	96	96	96	96	96	96	96	96	96	96	2.32	8.43*
Lacefield MaxQ II ³	4.0	50.8	54.5	55.0	100	99	99	100	100	100	100	100	100	100	100	100	100	100	2.13	8.21*
Select	4.0	55.0	55.5	56.0	99	98	99	99	99	99	99	99	99	99	99	99	99	99	1.86	8.21*
Jesup MaxQ ³	3.0	56.0	55.5	56.0	100	96	98	98	98	98	98	98	98	98	98	98	98	98	1.74	7.91*
Experimental Varieties																				
AGRFA-179/AR584 ³	4.0	44.8	50.0	51.5	100	97	100	100	100	100	100	100	100	100	100	100	100	100	1.89	8.82*
HTWC4	3.9	51.8	55.5	56.0	100	97	99	99	99	99	99	99	99	99	99	99	99	99	2.25	8.82*
KYFA0701	4.6	52.5	54.0	55.0	100	98	98	98	98	98	98	98	98	98	98	98	98	98	2.28	8.80*
KYFA9732/AR584 ³	4.1	45.0	50.5	55.0	100	99	99	100	100	100	100	100	100	100	100	100	100	100	2.00	8.72*
KYFA9821/AR584 ³	3.1	50.5	56.0	56.0	99	97	99	99	99	99	99	99	99	99	99	99	99	99	2.22	8.68*
GT213/AR584 ³	4.1	52.5	51.5	54.0	100	100	100	100	100	100	100	100	100	100	100	100	100	100	1.96	8.59*
AGRFA-178/AR584 ³	3.4	46.3	51.0	53.5	100	99	100	99	99	99	99	99	99	99	99	99	99	99	2.00	8.30*
KY31- ³	3.1	52.5	54.5	54.0	100	98	99	99	99	99	99	99	99	99	99	99	99	99	1.81	8.09*
BARFAF13131	2.3	49.3	54.0	56.0	99	85	93	93	93	93	93	93	93	93	93	93	93	93	1.98	8.05*
AGRFA-201/AR605 ³	2.1	55.0	56.5	56.5	99	93	94	95	95	95	95	95	95	95	95	95	95	95	2.12	7.56*
AGRFA-200/AR584 ³	4.4	41.0	45.0	47.5	100	99	100	100	100	100	100	100	100	100	100	100	100	100	1.53	7.25
Mean	3.6	50.9	53.4	54.6	99	96	98	98	98	98	98	98	98	98	98	98	98	98	2.05	8.40
CV ³	16.7	5.3	2.0	2.2	1	4	2	2	2	2	2	2	2	2	2	2	2	2	43.24	13.17
LSD _{0.05}	0.8	3.8	1.5	1.7	2	5	3	3	3	3	3	3	3	3	3	3	3	3	0.54	0.57

¹ Vigor score based on a scale of 1 to 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 and AR605 are non-toxic endophytes 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.

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.

Table 6. Dry matter yields, seedling vigor, maturity, and stand persistence of tall fescue varieties sown September 4, 2014, at Lexington, Kentucky.

Variety	Seedling Vigor ¹ Oct 9, 2014	Maturity ²		Percent Stand					Yield (tons/acre)					2-year Total
		2015	2016	2014	2015		2016		2015	2016				
		May 6	May 2	Oct 9	Apr 2	Oct 29	Mar 21	Oct 17	Total	May 3	Jun 23	Aug 24	Total	
Commercial Varieties-Available for Farm Use														
Drover	3.5	56.5	56.5	98	97	97	98	99	3.58	1.86	1.53	0.65	4.03	7.61*
Select	3.5	53.0	56.0	98	99	99	99	99	3.61	1.72	1.22	0.81	3.76	7.36*
Jesup MaxQ ³	4.1	54.0	55.0	100	100	100	100	100	3.61	1.70	1.27	0.70	3.67	7.28*
Lacefield MaxQ II ³	4.4	50.5	52.0	100	100	100	100	100	3.30	1.46	1.50	1.03	3.98	7.28*
Teton II	4.0	56.0	56.0	98	99	99	99	100	3.09	2.06	1.14	0.81	4.00	7.10*
SS-0705TFSL	4.6	52.0	54.5	100	100	100	100	100	3.44	1.49	1.42	0.71	3.62	7.06*
Kentucky 32	3.6	55.0	55.5	99	100	100	100	100	3.12	1.73	1.15	0.79	3.68	6.80*
KY31+ ³	4.6	46.3	47.5	100	100	100	100	100	2.97	1.46	1.37	0.92	3.76	6.73*
Cajun II	4.3	55.5	56.0	100	100	100	100	100	2.84	1.76	1.49	0.61	3.86	6.70*
BarOptima PLUS E34 ³	3.9	46.3	45.0	100	99	99	99	100	3.07	1.59	0.99	0.77	3.35	6.42
Brutus	4.0	51.5	50.3	100	100	100	100	100	3.32	1.23	1.14	0.68	3.05	6.37
Experimental Varieties														
KYFA1114/AR584 ³	4.3	47.5	52.0	100	100	100	100	100	3.60	1.65	1.63	0.88	4.16	7.76*
PPG-FTF-109	4.3	55.5	56.5	100	100	100	100	100	3.56	1.91	1.24	0.97	4.12	7.67*
KYFA1106	4.8	46.3	52.5	100	100	100	100	100	3.38	1.66	1.62	0.77	4.05	7.43*
PPG-FTF-106	3.9	56.5	57.0	99	99	99	99	99	3.24	1.67	1.48	0.93	4.08	7.32*
KYFA1110	4.5	53.5	55.5	100	100	99	99	99	3.47	1.58	1.48	0.73	3.79	7.26*
NFTF 1044	3.5	51.5	53.5	100	100	99	99	100	3.44	1.40	1.58	0.83	3.81	7.25*
PPG-FTF-105	3.5	56.0	56.0	98	99	99	99	100	3.11	2.02	1.17	0.82	4.00	7.12*
KYFA1103	4.4	53.5	55.5	100	100	100	100	100	3.23	1.69	1.47	0.66	3.83	7.05*
NFTF 1051	4.4	54.5	56.0	99	99	98	98	98	3.26	1.71	1.31	0.76	3.78	7.04*
NFTF 1370	3.9	53.5	56.0	100	100	100	100	100	3.21	1.92	1.18	0.68	3.78	6.99*
13SLTF10-3	3.8	46.3	46.8	100	99	99	99	99	3.45	1.45	1.26	0.80	3.51	6.96*
GO-12F	4.1	46.3	49.8	100	100	99	99	100	3.44	1.36	1.28	0.81	3.45	6.88*
KY31- ³	3.9	52.0	54.5	100	99	99	99	99	3.38	1.60	1.11	0.67	3.38	6.76*
TFBG13-1	3.8	56.0	56.0	98	99	98	98	98	3.19	1.71	1.02	0.70	3.43	6.62*
KYFA1104	3.9	49.8	52.0	99	100	99	99	99	3.61	1.17	1.13	0.62	2.92	6.53*
KYFA1108	3.8	47.5	46.3	100	100	100	100	100	3.08	1.19	1.13	1.08	3.40	6.49*
BARFAF13131	3.3	49.3	52.0	96	97	97	98	98	2.89	1.62	1.07	0.80	3.49	6.38
KYFA1113/AR584 ³	4.8	45.0	53.0	100	99	99	99	99	3.09	1.44	1.16	0.65	3.25	6.35
13SLTF10-2	4.0	45.0	46.3	100	100	99	99	99	3.03	1.34	1.03	0.79	3.15	6.18
KYFA1115/AR584 ³	3.5	46.3	48.5	100	100	100	100	100	2.76	1.43	1.36	0.53	3.31	6.07
KYFA0905	3.6	47.5	49.3	98	98	98	99	99	2.78	1.47	0.90	0.82	3.18	5.96
KYFA1112	3.1	46.8	50.8	100	100	100	100	100	2.84	1.37	1.04	0.69	3.10	5.93
KYFA1111	3.4	45.0	49.0	99	99	99	99	99	2.43	1.31	1.01	0.87	3.19	5.62
Mean	4.0	50.8	52.6	99	99	99	99	99	3.22	1.58	1.26	0.77	3.62	6.83
CV,%	14.6	3.9	4.1	2	1	1	1	1	16.60	22.99	24.15	39.78	17.34	13.72
LSD,0.05	0.8	2.8	3.0	2	2	2	2	2	0.75	0.51	0.43	0.43	0.88	1.32

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.

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 11. Yields are given by cutting date for 2016 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 12 and 13 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 12 and 13, 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 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 brome grass varieties (tables 5-11).

Tables 14 and 15 are summaries of yield data from 2000 to 2016 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 table 14 and 15 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 14 and 15 to determine to which yearly report to refer.

Table 7. 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 2016 May 2	Percent Stand			Yield (tons/acre)			
			2015		2016	2016			Total
			Oct 15	Mar 18	Oct 17	May 3	Jun 22	Aug 24	
Commercial Varieties-Available for Farm Use									
Drover	4.5	56.5	100	100	100	2.34	2.08	1.10	5.53*
Select	4.4	54.5	100	100	100	2.34	1.78	1.36	5.49*
BarOptima PLUS E34 ³	4.5	45.0	100	100	100	2.40	2.04	1.02	5.46*
Jesup MaxQ ³	4.6	55.0	100	100	100	2.23	2.13	1.03	5.39*
SS-0705TFSL	4.8	52.0	100	100	100	2.33	1.90	1.13	5.37*
HyMark	4.4	54.0	100	100	100	2.09	2.15	1.04	5.28*
Cajun II	3.9	56.0	100	100	100	1.79	2.03	0.98	4.80*
KY31+ ³	4.6	45.0	100	100	100	1.64	1.94	1.17	4.75
FSG 402TF	4.9	49.8	100	100	100	1.67	1.94	1.06	4.67
Lacefield MaxQ II ³	5.0	47.5	100	100	100	1.82	1.74	1.04	4.61
Baguala	4.8	56.0	100	100	100	2.08	1.53	0.87	4.48
Dominate	4.8	55.0	100	95	97	1.73	1.57	0.98	4.28
Experimental Varieties									
KYFA1103	4.6	52.8	100	100	100	2.51	1.99	1.30	5.79*
DLFPS-FTF-89	4.9	56.5	100	100	100	2.37	2.05	1.20	5.62*
KYFA1113	4.9	51.3	100	100	100	2.28	2.03	1.27	5.59*
KYFA1102	5.0	55.5	100	100	100	2.28	1.93	1.18	5.39*
KYFA1104	4.8	49.8	100	100	100	2.07	2.33	0.91	5.31*
DLFPS-FTF-93	4.1	57.5	100	100	100	2.15	1.84	1.31	5.30*
KYFA1109	4.3	48.0	100	100	100	1.79	1.99	1.17	4.96*
KY31- ³	4.3	48.5	100	100	100	1.83	2.04	1.02	4.89*
KYFA1311	4.6	49.8	100	100	100	1.77	1.82	1.27	4.86*
DLFPS-FTF-96	4.4	50.0	100	100	100	2.06	1.52	1.19	4.76
DLFPS-FTF-73	4.4	46.3	100	100	100	2.01	1.92	0.80	4.74
Drover+E343	4.0	55.5	100	100	100	1.86	1.58	1.13	4.57
KYFA1110	4.6	51.8	100	100	100	1.85	1.67	1.04	4.56
KYFA9821/AR584 ³	4.8	52.0	100	100	100	1.79	1.67	0.99	4.45
KYFA1114	4.9	48.8	100	100	100	1.63	1.85	0.91	4.39
BARFAF13131	3.8	52.0	100	100	100	1.67	1.45	0.91	4.03
Mean	4.5	51.9	100	100	100	2.01	1.88	1.09	4.98
CV,%	9.2	4.8	0	1	1	20.43	16.67	32.22	14.36
LSD,0.05	0.6	3.5	0	1	1	0.58	0.44	0.49	1.01

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.

Summary

Selecting a good variety of tall fescue and brome grass 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

G.L. Olson is a research specialist and S.R. Smith is an Extension professor in Forages. T.D. Phillips is an associate professor in Tall Fescue Breeding.

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 2016 May 4	Percent Stand			Yield (tons/acre)					
			2015		2016		2016				
			Oct 15	Mar 22	Nov 2	May 4	Jun 7	Aug 23	Nov 2	Total	
Commercial Varieties-Available for Farm Use											
Lacefield MaxQ II ³	4.4	56.0	100	100	100	4.21	1.09	1.24	1.29	7.83*	
SS-0705TFSL	3.3	57.0	100	100	100	3.91	1.12	1.36	1.18	7.56*	
HyMark	2.9	57.5	100	100	100	3.87	1.23	1.12	1.23	7.46*	
FSG 402TF	3.6	55.5	100	100	100	3.83	1.19	1.31	1.08	7.40*	
Bronson	3.0	57.0	100	100	100	3.64	1.14	1.45	1.09	7.32*	
Cajun II	4.1	58.0	100	100	100	3.67	1.19	1.27	1.11	7.24*	
Select	3.6	57.0	100	100	100	3.54	1.17	1.23	1.21	7.15*	
Dominate	4.0	58.0	100	100	100	3.57	1.12	1.35	1.04	7.08*	
Jesup MaxQ ³	2.5	58.0	100	100	100	3.65	0.92	1.36	1.12	7.06*	
BarOptima PLUS E34 ³	2.6	54.0	100	100	100	3.25	1.06	1.27	1.21	6.79	
KY31+ ³	3.1	55.0	100	100	100	3.21	1.26	1.16	1.12	6.74	
Baguala	2.9	57.5	100	100	100	3.34	0.86	1.32	1.08	6.61	
Experimental Varieties											
KYFA1104	4.3	56.0	100	100	100	3.71	1.35	1.53	1.17	7.76*	
KYFA1113	4.0	56.0	100	100	100	3.96	1.30	1.22	1.08	7.56*	
KYFA1114	4.3	55.0	100	100	100	3.86	1.19	1.29	1.15	7.49*	
DLF PS-FTF-89	3.6	57.0	100	100	100	3.64	1.11	1.43	1.20	7.38*	
KYFA1311	3.1	55.5	100	100	100	3.56	1.28	1.31	1.21	7.36*	
KYFA1102	4.6	57.5	100	100	100	3.54	1.26	1.28	1.18	7.26*	
KYFA1109	3.9	55.5	100	100	100	3.51	1.16	1.40	1.18	7.25*	
FYFA1103	4.4	56.0	100	100	100	3.61	1.16	1.36	1.06	7.18*	
DLFPS-FTF-73	3.0	54.0	100	100	100	3.46	1.25	1.27	1.11	7.09*	
KYFA1110	3.5	56.0	100	100	100	3.40	1.42	1.27	0.99	7.08*	
KY31- ³	3.4	56.0	100	100	100	3.44	0.95	1.39	1.13	6.91	
KYFA9821/AR584 ³	4.6	56.0	100	100	100	3.62	1.14	1.14	0.95	6.85	
DLFPS-FTF-96	3.3	55.5	100	100	100	2.96	1.32	1.26	1.27	6.81	
DLFPS-FTF-93	2.5	58.0	100	100	100	3.09	1.05	1.14	1.16	6.44	
Mean	3.6	56.3	100	100	100	3.58	1.16	1.30	1.14	7.18	
CV,%	21.4	1.6	0	0	0	12.01	19.64	18.66	13.43	8.71	
LSD,0.05	1.1	1.3	1	0	0	0.61	0.32	0.34	0.22	0.88	

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.

Table 9. Dry matter yields, seedling vigor, and stand persistence of tall fescue varieties sown August 29, 2013, at Quicksand, Kentucky.

Variety	Seedling Vigor ¹ Oct 3, 2013	Percent Stand							Yield (tons/acre)					3-year Total	
		2013		2014		2015		2016		2016					
		Oct 3	Mar 27	Nov 3	Apr 8	Oct 29	Mar 27	Nov 3	Total	Total	May 5	Jul 18	Nov 4		Total
Commercial Varieties-Available for Farm Use															
Lacefield MaxQ II ²	3.6	100	99	99	99	99	99	99	6.69	4.57	1.40	1.03	1.06	3.49	14.75*
KY31+ ²	3.3	100	100	100	100	100	99	99	6.24	4.39	1.28	1.19	1.37	3.84	14.47*
Jesup MaxQ ²	2.0	100	97	98	99	99	99	97	5.83	4.21	1.12	0.91	0.99	3.03	13.07
Select	3.3	100	98	98	98	98	97	96	6.11	4.01	1.18	0.87	0.86	2.92	13.04
Bull	2.0	100	98	97	97	97	97	96	5.72	3.73	1.41	0.80	0.81	3.01	12.46
BarOptima PLUS E34 ²	2.3	99	97	97	97	97	95	95	5.71	3.60	1.05	1.00	0.84	2.89	12.20
Cajun II	1.5	95	78	90	90	92	91	91	4.00	4.25	1.38	1.07	1.06	3.50	11.75
Experimental Varieties															
KYFA9732/AR584 ²	4.3	100	100	100	100	100	99	99	7.34	4.94	1.18	1.05	1.48	3.71	15.99*
KY31- ²	2.0	100	96	98	98	98	99	97	6.91	4.37	1.33	1.12	1.11	3.56	14.84*
KYFA0701	4.5	100	100	99	99	99	99	99	6.01	4.36	1.20	1.34	1.20	3.75	14.11
KYFA9821/AR584 ²	1.5	100	98	98	99	99	98	99	5.80	4.51	1.36	1.00	1.07	3.43	13.74
HTWC4	3.1	100	94	97	97	97	97	96	5.55	4.03	1.21	1.02	1.00	3.24	12.82
Mean	2.8	99	96	98	98	98	97	97	5.99	4.25	1.26	1.03	1.07	3.36	13.60
CV,%	33.6	1	5	2	2	2	2	3	11.24	11.83	20.54	18.13	24.35	16.21	8.39
LSD,0.05	1.3	1	6	3	3	3	3	4	0.97	0.72	0.37	0.27	0.38	0.74	1.64

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 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.

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)					2-year Total
			2015		2016	2014	2015		2016		2015	2016				
			May 6	May 11	Jun 14	Oct 9	Apr 2	Oct 29	Mar 21	Oct 17	Total	May 12	Jun 15	Aug 16	Total	
Commercial Varieties-Available for Farm Use																
MacBeth	meadow	4.8	56.0	58.0	59.0	81	89	89	85	84	3.39	1.23	0.52	0.66	2.40	5.79*
Carlton	smooth	4.0	29.0	52.5	59.5	85	70	77	76	74	2.59	0.83	1.06	0.59	2.48	5.07*
AC Knowles	hybrid	4.3	48.5	55.5	60.0	93	88	89	87	75	2.40	0.72	0.66	0.57	1.95	4.36
Experimental Varieties																
BARBcFiFRRL	meadow	4.8	57.0	58.0	29.0	95	94	94	90	85	3.25	1.68	0.62	0.57	2.87	6.12*
MSB	-	4.8	46.3	54.0	29.0	94	89	91	91	84	3.10	1.50	0.55	0.43	2.48	5.57*
GO-13SBF	smooth	4.3	51.5	55.5	59.0	82	82	84	84	79	2.95	0.91	0.37	0.53	1.81	4.76
Mean		4.5	48.0	55.6	49.3	88	86	87	86	80	2.95	1.14	0.63	0.56	2.33	5.28
CV,%		15.0	4.5	2.2	1.5	13	13	11	12	12	16.26	37.75	29.66	39.14	26.71	16.64
LSD,0.05		1.0	3.3	1.8	1.1	17	17	14	15	15	0.72	0.65	0.28	0.33	0.94	1.32

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 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)			
			2016		2015	2016		2016			
			May 3	Jun 14	Oct 15	Mar 18	Oct 17	May 3	Jun 15	Aug 19	Total
Commercial Varieties-Available for Farm Use											
MacBeth	meadow	5.0	56.0	58.5	100	100	100	2.52	1.70	1.39	5.61*
Peak	smooth	4.8	51.5	29.0	99	99	98	2.34	1.46	1.13	4.94*
Experimental Varieties											
GO-13SBF	smooth	3.5	52.5	54.0	96	96	96	1.69	1.77	1.04	4.50
Mean		4.4	53.3	47.2	98	98	98	2.18	1.64	1.19	5.02
CV,%		11.3	2.9	4.8	2	2	3	13.84	14.98	21.01	9.79
LSD,0.05		0.9	2.6	4	3	3	6	0.52	0.43	0.43	0.85

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

Variety	Proprietor/KY distributor	Lexington						Princeton	Quicksand		
		2013 ¹			2014		2015	2015	2013		
		14 ²	15	16	15	16	16	16	14	15	16
Commercial Varieties-Available for Farm Use											
Baguala	Allied Seed						x ³	X			
BarOptima PLUS E34 ⁴	Barenbrug USA	*	*	X	*	*	*	X	X	X	X
Bronson	Ampac Seed	X	*	*				*			
Brutus	Saddle Butte Ag. Inc.				*	X					
Bull	Caudill Seed								X	X	X
Cajun II	Smith Seed Services	X	*	*	X	*	*	*	X	*	*
Dominate	Allied Seed						X	*			
Drover	Barenbrug USA				*	*	*				
FSG 402TF	Farm Science Genetics						X	*			
Goliath	Ampac Seed	*	*	*							
Hymark	Fraser Seed						*	*			
Kentucky 32	Oregro Seeds				*	*					
KY31+ ⁴	Ky Agric. Exp. Station/Public	*	*	*	*	*	X	X	X	*	*
Jesup MaxQ ⁴	Pennington Seed	X	*	X	*	*	*	*	X	X	X
Lacefield MaxQ II ⁴	Pennington Seed	*	*	*	*	*	X	*	*	*	*
Select	Southern States	*	*	X	*	*	*	*	X	X	X
SS-0705TFSL	Southern States				*	*	*	*			
Teton II	Mountain View Seeds				*	*					
Experimental Varieties											
AGRFA-178/AR584 ⁴	AgResearch	*	*	*							
AGRFA-179/AR584 ⁴	AgResearch	*	*	X							
AGRFA-200/AR584 ⁴	AgResearch	*	X	X							
AGRFA-201/AR605 ⁴	AgResearch	X	*	*							
BARFAF13131	Barenbrug USA	X	*	X	*	*	X				
DLFPS-FTF-73	DLF-Pickseed						X	*			
DLFPS-FTF-89	DLF-Pickseed						*	*			
DLFPS-FTF-93	DLF-Pickseed						*	X			
DLFPS-FTF-96	DLF-Pickseed						X	X			
Drover+E34	Barenbrug USA						X				
GO-12F	Grassland Oregon				*	*					
GT213/AR584 ⁴	AgResearch	*	*	X							
HTWC4	KY Agric. Exp. Station	*	*	*					X	X	*
KY31- ⁴	KY Agric. Exp. Station	*	*	X	*	*	*	X	*	*	*
KYFA0701	KY Agric. Exp. Station	*	*	*					X	*	*
KYFA0905	KY Agric. Exp. Station				X	X					
KYFA1102	KY Agric. Exp. Station						*	*			
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					
KYFA1112	KY Agric. Exp. Station				X	X					
KYFA1113	KY Agric. Exp. Station						*	*			
KYFA1113/AR584 ⁴	KY Agric. Exp. Station				*	X					
KYFA1114	KY Agric. Exp. Station						X	*			
KYFA1114/AR584 ⁴	KY Agric. Exp. Station				*	*					
KYFA1115/AR584 ⁴	KY Agric. Exp. Station				X	*					
KYFA1311	KY Agric. Exp. Station						*	*			
KYFA9732/AR584 ⁴	KY Agric. Exp. Station	*	*	*					*	*	*
KYFA9821/AR584 ⁴	KY Agric. Exp. Station	*	*	*			X	X	X	*	*
NFTF 1044	Noble Foundation				*	*					
NFTF 1051	Noble Foundation				*	*					
NFTF 1370	Noble Foundation				*	*					
PPG-FTF-105	Mountain View Seeds				*	*					
PPG-FTF-106	Mountain View Seeds				*	*					
PPG-FTF-109	Mountain View Seeds				*	*					
TFBG13-1	Oregro Seeds				*	*					
13SLTF10-2	Oregro Seeds				*	X					
13SLTF10-3	Oregro Seeds				*	*					

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 and Lacefield MaxQ II contain a non-toxic endophyte. BarOptima PLUS E34 and Drover+E34 contain a beneficial endophyte. AR584 and AR605 are non-toxic endophytes 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.

Table 13. Performance of bromegrass varieties across years at Lexington.

Variety	Type	Proprietor/KY Distributor	2014 ¹		2015
			2015 ²	2016	2016
Commercial Varieties-Available for Farm Use					
AC Knowles	hybrid	Agriculture Canada	x ³	*	
Carlton	smooth	Pickseed USA	x	*	
MacBeth	meadow	Cisco Seeds	*	*	*
Peak	smooth	Allied Seed			*
Experimental Varieties					
BAR BcF1FRRL	meadow	Barenbrug USA	*	*	
GO-13SBF	smooth	Grassland Oregon	*	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 15. Summary of Kentucky bromegrass yield trials at Lexington 2006-2016 (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	Mean ³ (#trials)
			4-yr ⁴	3-yr	3-yr	3-yr	2-yr	
AC Knowles	hybrid	Agriculture Canada	85		82	102	86	89(4)
Bigfoot	hybrid	Grassland Oregon	108	116	105			110(3)
Canterbury	mountain	Barenbrug USA		79				—
Carlton	smooth	Pickseed USA				82	100	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	114	119(4)
Olga	smooth	Barenbrug USA		116	101			109(2)
Peak	smooth	Allied Seed		97		100		99(2)
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.

Table 14. Summary of Kentucky tall fescue yield trials 2000-2016 (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 2-yr	05 3-yr	07 3-yr	09 3-yr	11 3-yr	12 3-yr	13 3-yr	14 2-yr	00 2-yr	02 3-yr	04 3-yr	06 3-yr	08 3-yr	10 3-yr	12 3-yr	01 2-yr	03 2-yr	05 4-yr	13 3-yr																	
Atlas Select	ProSeeds Marketing																																					
Aprilia	ProSeeds Marketing																																					
BarElite	Barenbrug USA		87	99	96		100																					95(3)	94(3)									
Barolex	Barenbrug USA			90																																		
BarOptima PLUS E34 ⁵	Barenbrug USA			122	99		107	108	102	92																		102(9)										
Bronson	Ampac Seed			88	97	105	102	99	99																													
Brutus	Saddle Butte Ag. Inc.			102																																		
Bull	Improved Forages		98	102				100	105	96																		95										
Cajun II	Smith Seed Services							97																				90										
Carmin	DLF International		99																									98(2)										
Cowgirl	Rose-AgriSeeds									109																		99(4)										
DuraMax GOLD ⁵	DLF International																																					
Enhance	Allied Seed																											104(2)										
Estancia ArkShield ⁵	Mountain View Seeds																											100(2)										
Festival	Pickseed West		107																									103(4)										
Flourish	Allied Seed																											97(2)										
Goliath	Ampac Seed																											101(3)										
Hoedown	DLF International		104																										105(2)									
HyMark	Fraser Seeds																											97(2)										
Jesup EF	Pennington Seed																											102(4)										
Jesup MaxQ ⁵	Pennington Seed			98	101	110	103	100	93	104																		100(14)										
Johnstone	ProSeeds Marketing		108																																			
KENHY	KY Agric Exp Sta.																																					
Kentucky 32	Oregro Seeds																																					
Kokanee	Ampac Seed		89																										96(6)									
KY31+ ⁵	KY Agric Exp Sta.		118	112	108	102	102	93	95	103	97	104																88(2)										
Lacefield MaxQ II ⁵	Pennington Seed			98	101	110	103	100	93	104																			105(19)									
Maximize	Turf-Seed		95																									105(6)										
Martin2 Protek ⁵	DLF International																											97(4)										
Nanryo	Jap. Grassland ForageSeed/ USDA-ARS, El Reno, OK																																					
Noria	ProSeeds Marketing																																					
RAD-ERF50	Radix Research, Inc.																																					
Resolute	Ampac Seed		90																																			
Savory	DLF International																																					
Seine	Advanta Seeds																																					
Select	Southern States		106	94	99	98	90	100	97	106	101																		100(20)									
SS-0705TFSL	Southern States																																					
Stockman	Seed Research of OR																																					
Teton II	Mountain View Seeds																												103(4)									
Texoma MaxQ II ⁵	Pennington Seed			95																									103(4)									
TF0203G	Seed Research of OR																																					
Tower Protek ⁵	DLF International																																					
Tuscany	Forage Genetics																																					
Tuscany II	Seed Research of OR																																					
5CAN	Brett Young																												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. The other fescue varieties in this table do not contain an endophyte.

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BarOptima PLUS E34