

Kansas State University

2016 SEARC Agricultural Experiment Station and Cooperative Extension Service

Table 1. 2015 Heading date, and forage yield of three cuttings of tall fescue cultivars seeded in 2014, Mound Valley Unit

Cultivar	Heading date*	6/8	9/28	12/10	2015 total
	(julian)	tons/ acre, 12% moisture			
KY31 Endophyte Free	124.00	5.31	2.14	0.33	7.78
BarOptima PLUS E34	130.00	4.50	1.66	0.34	6.49
Bar FAF 131	124.00	4.26	2.01	0.34	6.60
Tower ProTek	127.00	4.39	2.35	0.29	7.02
Martin 2 ProTek	119.00	3.69	1.82	0.31	5.81
AGRFA 148	123.00	4.45	1.91	0.34	6.69
NFTF 1051	121.00	4.37	2.15	0.32	6.84
NFTF 1044	125.00	5.08	2.29	0.35	7.72
NFTF 1411	120.00	3.71	2.03	0.32	6.06
GT213	124.00	4.53	1.61	0.28	6.41
LE 14-84	114.00	3.72	2.29	0.27	6.28
LE14-86	124.00	4.61	2.11	0.28	7.00
Teton II	116.00	3.83	2.39	0.29	6.51
Estancia	125.00	4.26	2.38	0.31	6.94
PBU-B1	118.00	5.29	2.29	0.30	7.88
PBU-B2	117.00	4.75	2.15	0.30	7.20
PBU-B7	114.00	4.48	2.53	0.29	7.30
MV 14	124.00	4.44	2.32	0.32	7.07
KY 31 High Endophyte	126.00	4.74	1.77	0.33	6.84
Average	121.00	4.44	2.13	0.31	6.87
LSD (0.05)	3.20	0.90	0.58	0.02	1.10

*Average heading date, Julian day 121, was May 1.

Summary of the Tall Fescue Cultivars from J.L. Moyer (K-State):

"Spring 2015 yield was higher for the 'Ky 31 EF' than for nine of the 19 other entries. . . Total 2015 production was greater for 'PBU-B1' and Ky31 EF than for seven other cultivars."

Kansas K-State Tests - Weight Gain & Stand Densities

Stand Density of Tall Fescue Pastures, Southeast Agricultural Research Center, Kansas 2004, 2005, and 2006			
	Tall Fescue Cultivar		
	Low Endophyte Kentucky 31	ArkPlus	MaxQ
-----tillers/ ft2-----			
3/17/2004	62	70	70
12/1/2004	85	74	75
12/12/2005	135	118	134
12/14/2006	43	47	37

Table 1. Effect of Cultivar on Grazing Performance of Steers Grazing Tall Fescue Pastures. Southeast Agricultural Research Center, 2004 (257 days)				
Item	High-Endophyte KY31	Low-Endophyte KY31	ArkPlus	Max Q
No of Head	16	16	16	16
Initial wt., lb	513	513	513	512
Ending wt., lb	756	908	911	890
Gain, lb	243	396	399	377
Daily Gain, lb	0.94	1.54	1.55	1.47
Gain/acre, lb	194	317	319	302

UNIVERSITY OF KENTUCKY FESCUE TRIALS

Report Year	Planting Year	Variety	% survival 3 year	Total DM 3 year tons
2009	2005	K-31- (fungus free)	99	21.24
		JesupMaxQ	98	19.69
		K-31+ (fungus infected)	99	20.55
2009	2006	K-31- (fungus free)	98	10.61
		Kentucky 32	91	10.52
		K-31+ (fungus infected)	89	10.02
2010	2007	K-31- (fungus free)	100	11.31
		JesupMaxQ	100	11.27
		AR584#	100	12.87
		K-31+ (fungus infected)	100	10.80
2012	2009	JesupMaxQ	100	9.89
		K-31- (fungus free)	100	9.17
		AgR1502#	100	9.35
		K-31+ (fungus infected)	100	8.91
2012	2010	K-31+ (fungus infected)	97	13.40
		AgR1521	98	12.75
		K-31- (fungus free)	98	12.05
2013	2010	K-31- (fungus free)	98	10.92
		Jesup EF	97	10.04
		JesupMaxQ	99	9.70
		Kentucky 32	98	9.11
		K-31+ (fungus infected)	99	9.85

Table 11, Dry-matter yields, seedling vigor, and stand persistence of tall fescue varieties sown August 29, 2013 at Quicksand, Kentucky

Variety	Seedling Vigor Oct 3, 2013	Percent Stand			Yield (tons/acre) 2 year total 2014-2015
		2013	2014	2015	
KY31-	2.0	100	98	98	11.28
MaxQ II	3.6	100	99	99	11.27
Ky31+	3.3	100	100	100	10.63
Select	3.3	100	98	98	10.12
Jesup MaxQ	2.0	100	98	99	10.05
Bar Optima Plus E34	2.3	99	97	97	9.31
Mean	2.8	99	98	98	10.24

KY31- is the variety KY31 from which the toxic endophyte has been removed. KY31+ contains the toxic endophyte.

University of Kentucky 2014 Tall Fescue Report

Table 8. Dry matter yields, seedling vigor, maturity, and stand persistence of tall fescue and festulolium (FL) varieties sown Sept 12, 2012, at Princeton, Kentucky.

Variety	Seedling Vigor ¹ Oct. 29, 2012	Maturity ²		Percent Stand					Yield (tons/ acre)					
		2013	2014	2012	2013		2014		2013 Total	2014			2-Year Total	
		May 14	May 20	Oct 29	Mar 19	Oct 25	Apr 9	Oct 22		May 20	June 18	Oct 22		Total
TF 0401	3.3	57.0	59.0	100	100	100	100	100	8.22	1.57	0.68	1.15	3.40	11.62
Tuscany II	3.6	56.5	59.5	100	100	100	99	99	7.78	1.53	0.60	0.98	3.11	10.89
Mahulena (FL)	2.5	59.0	61.5	100	100	100	100	100	7.72	1.58	0.68	0.80	3.06	10.77
KY31- ³	4.6	55.5	59.5	100	100	100	100	99	7.70	1.43	0.57	0.95	2.95	10.64
IS-FTP 70	2.8	53.0	57.0	100	100	100	97	98	7.70	1.31	0.59	1.03	2.94	10.64
Flourish	2.3	55.0	58.0	97	99	99	99	99	7.66	1.43	0.60	0.89	2.92	10.59
KYFA0906	4.1	54.5	56.5	100	100	100	100	100	7.35	1.42	0.58	1.08	3.08	10.43
BarOptima PLUS E34	3.0	53.5	57.0	100	100	100	100	100	7.37	1.56	0.65	0.83	3.04	10.41
KYFA0901	3.8	57.0	61.5	100	100	100	100	100	7.28	1.40	0.57	1.14	3.11	10.39
Kentucky 32	2.3	57.0	61.5	99	99	99	98	100	7.23	1.51	0.56	1.05	3.11	10.35
Estancia Arkshield	4.6	57.5	30.0	100	100	100	100	100	7.21	1.48	0.66	0.98	3.12	10.33
Select	3.1	56.5	60.5	99	100	100	100	99	7.31	1.65	0.49	0.84	2.98	10.30
KYFA0905	3.8	54.5	57.5	100	100	100	100	100	7.38	1.28	0.53	1.11	2.92	10.30
Teton II	2.8	57.5	60.5	100	100	100	100	99	7.49	1.35	0.52	0.92	2.79	10.28
Jesup EF	4.0	57.5	61.5	100	100	100	100	100	7.25	1.59	0.51	0.89	2.99	10.24
KY31+ ³	5.0	54.5	56.0	100	100	100	100	100	7.37	1.28	0.67	0.91	2.86	10.23
Cowgirl	3.0	56.5	59.5	100	100	100	100	100	7.03	1.43	0.58	1.07	3.09	10.12
Jesup MaxQ	3.6	57.5	61.5	100	10	100	100	99	7.44	1.27	0.56	0.78	2.61	10.05
Bull	3.4	58.0	60.0	99	100	100	100	100	7.21	1.20	0.58	1.04	2.82	10.03
Fojtan (FL)	2.5	53.5	57.5	100	100	100	100	100	7.17	1.35	0.55	0.91	2.80	9.98
PPG-FTF 104	2.5	55.0	57.5	99	99	99	99	99	7.13	1.22	0.47	0.96	2.65	9.77
Bronson	3.4	56.5	59.5	100	100	100	100	96	6.59	1.43	0.51	0.76	2.70	9.29

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 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.

Table 5. Dry matter yields, seedling vigor, maturity and stand persistence of tall fescue varieties sown September 6, 2010, at Lexington, Kentucky.

Variety	Seedling Vigor ¹ Oct 26, 2010	Maturity ²			Percent Stand									Yield (tons/acre)						3-year Total
		2011			2012			2013			2011		2012		2013					
		May 9	Apr 25	May 22	Oct 26	Mar 16	Nov 7	Mar 21	Oct 23	Mar 22	Oct 21	Total	Total	May 23	Jun 25	Aug 5	Oct 21	Total		
KY31+ ³	3.3	56.0	46.8	60.0	97	97	98	98	97	97	97	4.74	2.49	2.66	0.85	1.02	1.65	6.17	13.40*	
KYFA0701	3.3	56.0	49.3	60.0	98	99	100	100	99	99	99	5.05	2.44	2.47	0.73	0.98	1.56	5.74	13.23*	
KYFA9732/E5	3.4	54.5	48.5	59.5	100	100	99	100	99	98	98	5.11	2.61	2.60	0.66	0.85	1.35	5.46	13.18*	
KYFA9908/E1	3.0	52.0	45.0	58.0	100	97	97	97	97	97	97	5.22	2.30	2.37	0.65	0.86	1.53	5.41	12.92*	
KYFA9908/E4	2.6	54.5	45.0	57.0	99	97	96	97	96	96	96	4.99	2.22	2.53	0.77	0.95	1.41	5.66	12.87*	
KYFA9913EF	2.8	56.0	50.3	61.0	99	99	99	98	98	98	98	4.88	2.11	2.43	0.78	0.99	1.63	5.83	12.82*	
KYFA0601	2.9	56.0	50.8	61.5	98	99	99	99	99	99	99	4.89	2.42	2.37	0.69	0.99	1.44	5.49	12.79*	
AgR1521	2.1	55.5	52.0	62.0	94	95	97	97	98	98	98	4.32	2.49	2.93	0.67	0.99	1.36	5.95	12.75*	
KYFA9908/E3	2.8	53.5	46.8	57.5	98	96	99	96	96	95	96	5.14	2.25	2.54	0.73	0.77	1.29	5.33	12.72*	
KYFA9908/E5	2.3	54.0	48.0	60.0	98	88	94	97	96	96	96	4.60	2.50	2.73	0.71	0.73	1.42	5.60	12.70*	
AgR1502	2.3	56.0	53.0	61.0	97	95	97	97	98	98	98	4.61	2.44	2.47	0.71	0.85	1.56	5.59	12.64*	
KYFA9913/E5	3.0	54.5	46.3	59.0	97	95	97	97	98	97	98	4.67	2.38	2.49	0.66	0.97	1.47	5.59	12.64*	
KYFA9732EF	2.5	54.5	49.3	59.5	99	95	96	95	96	95	95	5.35	1.98	2.42	0.65	0.78	1.36	5.21	12.54*	
KYFA9732/E1	3.6	54.0	45.0	58.5	100	98	99	99	98	97	96	4.97	2.18	2.30	0.60	0.89	1.55	5.34	12.48*	
KYFA9905/E5	3.0	54.0	46.3	59.0	100	99	100	100	99	99	99	4.62	2.27	2.42	0.64	0.92	1.55	5.53	12.42*	
KYFA9905EF	3.0	55.0	45.0	59.5	97	97	97	98	98	98	98	4.76	2.14	2.25	0.65	0.87	1.50	5.27	12.18*	
KY31+ ³	2.9	54.0	45.0	61.0	98	95	96	98	99	99	98	4.48	2.28	2.20	0.76	0.90	1.43	5.29	12.05*	
KYFA9905/E2	3.9	54.5	46.8	58.0	98	100	100	100	99	99	99	4.81	2.17	2.37	0.54	0.81	1.34	5.06	12.04*	
KYFA9732/E2	3.0	54.0	48.0	58.0	99	97	98	98	98	96	97	4.87	2.01	2.14	0.63	0.86	1.43	5.07	11.94*	
KYFA9913/E1	3.3	53.5	48.0	60.0	97	95	97	97	96	96	97	4.68	2.05	2.43	0.58	0.87	1.28	5.15	11.89*	
KYFA9905/E1	2.9	53.5	46.3	59.0	98	99	100	100	99	99	100	4.61	1.96	2.30	0.61	0.93	1.44	5.28	11.84*	
KYFA9908EF	3.5	54.0	48.0	59.0	99	97	96	96	97	96	97	4.76	2.12	2.02	0.60	0.91	1.38	4.90	11.79	
KYFA9913/E2	2.4	54.0	51.5	59.5	97	96	97	97	98	98	98	4.73	2.24	2.30	0.50	0.77	1.21	4.78	11.75	
KYFA0901	2.9	56.0	53.5	61.5	98	95	96	96	96	95	95	4.39	1.98	2.48	0.65	0.71	1.29	5.13	11.50	
Mean	2.9	54.6	48.1	59.5	98	96	97	98	98	97	97	4.80	2.25	2.43	0.67	0.88	1.44	5.41	12.46	
CV,%	25.2	1.8	5.5	3.0	2	5	3	2	2	2	2	10.63	10.68	14.71	20.77	16.55	16.03	12.16	8.99	
LSD,0.05	1.0	1.4	3.7	2.5	3	7	4	3	3	3	3	0.72	0.34	0.50	0.20	0.21	0.32	0.93	1.58	

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 KY31- is the variety KY31 from which the toxic endophyte has been removed. KY31+ contains the toxic endophyte. AgR1502 and AgR1521 contain a non-toxic endophyte. E1 through E5 are non-toxic endophytes. The other varieties do not contain an endophyte.

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

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 nine studies are reported. Tall fescue varieties were sown at Lexington (2010, 2011 and 2012), Princeton (2010 and 2012) and Quicksand (2010). The bromegrass trials were sown in Lexington in 2010 and 2012. 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-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, weed control, and harvest timing were in accordance with University of Kentucky recommendations.

Table 5. Seedling vigor and percent stand of forage grasses sown September 17, 2003 at Lexington, Kentucky in a horse grazing tolerance study.				
Variety	Species	Seedling Vigor ¹ Oct 31, 03	Percent Stand	
			Mar 26, 04	Nov 8, 04
Commercial Varieties—Available for Farm Use				
Select	tall fescue	4	99	88*
KY 31-	tall fescue	5	99	88*
ArkPlus	tall fescue	5	100	85*
Haymate	orchardgrass	4	98	83*
Common	KY bluegrass	3	99	75
Barfleo	timothy	3	96	72
Peak	smooth brome	3	91	37
Ginger	KY bluegrass	3	81	10
Experimental Varieties				
KYFA 0006	tall fescue	5	99	90*
KYFA 9304	tall fescue	5	98	90*
KYTF 2	tall fescue	5	99	90*
KYFA 9611	tall fescue	4	96	88*
KYFA 9819	festulolium	5	99	87*
KYFA 9602	tall fescue	4	96	83*
TM 9901	timothy	4	96	78
Mean		4.0	96.4	76.3
CV, %		8.7	9.6	10.9
LSD, 0.05		0.4	10.7	9.5
*Not significantly different from the highest value in the column, based on the 0.05 LSD.				
¹ Vigor score based on a scale of 1 to 5 with 5 being the most vigorous seedling growth.				

ENDOPHYTE-FREE KY-31 COMPARISONS

HORSE GRAZING TOLERANCE University of Kentucky, Lexington

	Variety	Seedling vigor 1-5, 5=highest	% stand survival	
sown 9/12/01			9/1/05	
	K-31 E+	3.7	63	
	K-31 E-	3.7	60	
sown 9/21/02			10/31/05	} 3 YEARS
	K-31 E-	4.3	88	
	Jessup MaxQ	3.7	82	
sown 9/17/03			10/31/05	
	K-31 E-	5.0	100	
	Select	3.7	97	
sown 9/3/04			10/31/05	
	K-31 E-	4.7	99	
	Seine	4.2	100	
	Stockman	3.8	98	

CATTLE GRAZING TOLERANCE Lexington

sown 9/12/01			9/1/05
	K-31 E+	4.7	87
	K-31 E-	4.5	85
	Stargrazer	2.8	77
sown 9/19/02			10/31/05
	K-31 E-	4.8	100
	K-31 E+	4.8	99
	Jessup MaxQ	3.5	98

	variety	seedling vigor	% stand survival	grazing preference
sown 9/13/03				10/31/05
	K-31 E+	4.8	100	37
	K-31 E-	5.0	100	25
	Jessup MaxQ	4.2	99	25
sown 9/14/04				10/31/05
	Stockman	3.5	99	
	K-31 E-	4.0	99	
	K-31 E+	2.3	97	
sown 9/25/02 (Princeton)				11/3/05
	Jessup MaxQ		82	
	K-31 E+		81	
	K-31 E-		81	

**DRY MATTER YIELD
tons per acre**

	Variety	seedling vigor	2003	2004	2005	2/3 yr total	%stand
Lexington							11/31/05
sown 9/16/03	K-31 E+	4.8		7.04	5.19	12.23	98
	Stockman	4.0		7.66	4.07	11.73	93
	K-32 E-	4.5		6.94	3.96	10.90	96
Princeton							11.31/05
sown 9.25.02	K-31 E+		5.03	3.76	3.57	12.36	95
	K-31 E-		4.72	3.85	3.13	11.70	95
	Jessup MaxQ		4.70	3.18	3.76	11.64	95
Princeton							11/3/05
sown 9/1/04	K-31 E+	3.0			5.68		98
	Stockman	3.3			5.58		96
	K-31 E-	3.3			5.20		98
	Seine	2.8			4.94		99

*for complete results, contact the University of Kentucky