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2013 Summer Annual Grass Report

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Introduction

Summer annual grasses provide an important forage crop option for producers in Kentucky. These grasses are mainly used as emergency or supplemental hay and pasture crops, but little information is available on their yield potential. The purpose of this publication is to summarize the University of Kentucky 2009-2013 forage yield trials with sudangrass, sorghum/sudangrass, millets, and teff.

Sudangrass *(Sorghum bicolor* ssp. *drummondi)* is a rapidly growing annual grass in the sorghum family. It is medium yielding and well suited for grazing or hay because of its smaller stem size. Sudangrass regrows quickly after harvest and can be grazed several times during summer and early fall.

Sorghum x sudangrass hybrids are more vigorous and slightly higher yielding than sudangrass. A larger stem size makes these hybrids less useful for hay; therefore, they are commonly used for baleage and grazing.

Forage sorghum is used primarily as silage for livestock and is typically a one cut crop. It grows 9-12 feet tall and is harvested when the seed is in the dough stage.

Pearl millet (*Pennisetum glaucum*) is the most widely grown type of millet. It is well adapted to production systems characterized by drought, low soil fertility, and high temperature. It is higher yielding than foxtail millet and regrows rapidly after harvest if an 8- to 10-inch stubble height is left. Dwarf varieties, which are leafier and better suited for grazing, are available.

Teff, also referred to as summer lovegrass (*Eragrostis tef*), is a warm-season annual grass native to Ethiopia and has been used as a grain crop for thousands of years. Recently, there has been considerable interest in teff as a forage crop. It is high quality, palatable, and fine-stemmed and, therefore, makes excellent hay.

Considerations in Selecting a Summer Annual Variety

The major factor in selecting a variety of summer annual grass is yield, both total and seasonal. Growth after first cutting is strongly dependent on available moisture and nitrogen fertilization. Summer annual grasses generally have different characteristics and uses. Pearl millets vary considerably in height and can be used for both pasture and hay. Pearl millet has the advantage of not producing prussic acid (HCN or cyanide). Sudangrass and sorghum-sudangrass hybrids are related grasses (in the sorghum family) and can produce prussic acid immediately after frost or when immature shoots are grazed during severe drought. Sudangrasses are considered to have the least potential for prussic acid poisoning. Sudangrass has smaller, finer stems than sorghum-sudangrass hybrids, which have finer stems than forage sorghums. Consequently, sudangrasses are more easily cured for hay. Pearl millets, sudangrass, sorghum-sudangrass, and teff are typically harvested multiple times during the growing season, and foxtail millet is harvested only once. For more detailed management recommendations refer to *Producing Summer Annual Grasses for Emergency or Supplemental Forage* (AGR-88), and *Teff,* which can be found at www.uky.edu/Ag/Forage under "Publications" in the "Grass" species.

Description of the Tests

This report summarizes studies at Lexington (three in 2009, three in 2010, three in 2011, three in 2012 and five in 2013). The soil at Lexington (Maury) is

Table 1. Temperature and rainfall at Lexington, Kentucky in 2009, 2010, 2011, 2012, and 2013.

	2009				2010				2011				2012				2013[2]			
	Temp		Rainfall		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	°F	DEP	IN	DEP
JAN	28	-3	2.45	-0.41	29	-2	2.40	-0.46	29	-2	2.10	-0.76	38	+7	4.80	+1.94	38	+7	4.50	+1.64
FEB	38	+3	2.86	-0.35	29	-6	1.38	-1.83	39	+4	6.34	+3.13	40	+5	5.39	+2.18	36	+1	1.78	-1.43
MAR	48	+4	2.19	-2.21	47	+3	1.05	-3.35	47	+3	4.76	+0.36	56	+12	5.64	+1.24	39	-5	5.47	+1.07
APR	55	0	4.48	+0.60	59	+4	2.74	-1.14	58	+3	12.36	+8.48	56	+1	3.26	-0.62	55	0	4.46	+0.58
MAY	64	0	5.05	+0.58	67	+3	7.84	+3.37	64	0	6.72	+2.25	69	+5	4.02	-0.45	65	+1	5.23	+.076
JUN	74	+2	5.41	-1.75	76	+4	4.61	+0.95	74	+2	2.61	-1.05	73	+1	2.42	-1.24	72	0	7.32	+3.66
JUL	71	-5	5.89	+0.89	78	+2	5.49	+0.49	80	+4	6.29	1.29	81	+5	2.50	-2.50	72	-4	9.33	+4.33
AUG	73	-2	5.38	+1.45	78	+3	1.54	-2.39	75	0	2.89	-1.04	75	0	1.68	-2.25	72	-3	3.68	-0.25
SEP	68	0	5.37	+2.17	71	+3	1.14	-2.06	66	-2	5.52	+2.32	67	-1	6.40	+3.20	67	-1	2.21	-0.99
OCT	54	-3	4.83	+2.26	59	+2	1.22	-1.35	55	-2	4.10	+1.53	55	-2	2.00	-0.57	55	-2	8.10	+5.53
NOV	49	+4	0.94	-2.45	47	+2	4.58	+1.19	50	+5	9.53	+6.14	43	-2	1.81	-0.65				
DEC	36	0	3.86	-0.12	28	-8	2.15	-1.93	41	+5	5.58	+1.60	42	+6	9.57	+4.94				
Total			48.71	+4.16			36.14	-8.41			68.80	+24.25			49.49	+4.94			52.08	+14.90

[1] DEP is departure from the long-term average.
[2] 2013 data is for ten months through October.

a well-drained silt loam and is well suited to annual grass production. Plots were 5 feet x 20 feet in a randomized complete block design with four replications with a harvested area of 5 feet by 15 feet. All trials were sown into a prepared seedbed using a disk drill at the following rates (lb/acre): sudangrass (25), sorghum-sudangrass (30), forage sorghum (8), pearl millet (20), and teff (5 for uncoated, 8 for coated). Plots were harvested with a sickle-type forage plot harvester. Cutting height was 4 inches for the millets and teff and 6 inches for sudangrass and sorghum-sudangrass. The forage sorghum was harvested by hand (5 feet by 5 feet in the center of the plot). Fresh weight samples were taken at each harvest to calculate percent dry matter production. All tests were managed for establishment, fertility, pest control, and harvest according to University of Kentucky Cooperative Extension Service recommendations. Pests were controlled so that they would not limit yield. See individual yield tables for nitrogen application.

Results and Discussion

Weather data for Lexington is presented in table 1.

Yield data (on a dry matter basis) for all tests are reported in tables 3 through 19. Varieties are listed in order from highest to lowest total production. Yields are given by cutting and as a total for the year. Statistical analyses were performed on all yield data to determine if the apparent differences are truly due to variety or just due to chance. Varieties not significantly different from the highest numerical value in a column are marked with one asterisk (*). To determine if two varieties are truly different, compare the difference between the two varieties to the Least Significant Difference (LSD) 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 a given location. The Coefficient of Variation (CV), which is a measure of the variability of the data, 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 20, 21, and 22 are summaries of yield data from 2008 to 2013 of commercial varieties that have been entered in the Kentucky trials. The data are listed as a percentage of the mean of the commercial varieties entered in each specific trial. In other words, the mean for each trial is 100 percent—varieties with percentages over 100 yielded better than average, and varieties with percentages less than 100 yielded lower than average. Direct, statistical comparisons of varieties cannot be made using the summary tables 20, 21, and 22, 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; others may have performed very well in wet years or on particular soil types.

Table 2. 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 seedlingsor 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 quantitywhen inflorescence hit on palm.
93	Endosperm hard and dry	Final stage of seed development; most seeds shed.

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

Table 3. Dry matter yields, seedling vigor, percent stand, maturity and stand height of sudangrass varieties sown May 29, 2009, at Lexington, Kentucky.

Variety	Proprietor/ Distributor	Seedling Vigor[1] Jun 14	Percent Stand Jun 14	Maturity[2] Jul 15	Plant Height *(inches)*			Yield *(tons/acre)*			
					Jul 15	Aug 14	Sep 16	Jul 15	Aug 14	Sep 16	Total
Commercial Varieties—Available for Farm Use											
Hayking BMR	Central Farm	4.1	95	35	71	59	39	1.87	1.26	0.69	3.83*
ProMax BMR	Ampac Seed	4.5	98	35	69	56	36	1.73	1.14	0.57	3.44*
Monarch V	Public	5.0	99	35	68	47	27	1.98	1.00	0.29	3.27
Piper	Public	4.8	100	35	66	48	30	1.70	0.91	0.49	3.10
Mean		4.6	98	35	68	52	33	1.82	1.08	0.51	3.41
CV,%		9.6	2	0	4	5	13	9.81	11.62	18.13	8.22
LSD,0.05		0.7	4	0	4	4	7	0.29	0.20	0.15	0.45

[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 2 for complete scale.
*Not significantly different from the highest numerical value in the column, based on the 0.05 LSD.
Nitrogen application: 60# on June 9 and 25# on July 17.

Table 4. Dry matter yields, seedling vigor, percent stand, maturity and stand height of sudangrass varieties sown May 27, 2010, at Lexington, Kentucky.

Variety	Proprietor/ Distributor	Seedling Vigor[1] Jun 10	Percent Stand Jun 10	Maturity[2] Jul 7	Plant Height *(inches)*			Yield *(tons/acre)*			
					Jul 7	Jul 29	Sep 1	Jul 7	Jul 29	Sep 1	Total
Commercial Varieties—Available for Farm Use											
ProMax BMR	Ampac Seed	3.3	81	33.5	47	43	38	0.87	1.00	0.59	2.45*
Monarch V	Public	3.5	94	33.5	47	42	30	0.84	0.96	0.47	2.27*
SS130 BMR	Cal/West Seeds	2.5	66	33.5	47	45	29	0.76	0.99	0.49	2.24*
Enorma BMR	Cal/West Seeds	2.1	73	33.5	44	43	32	0.80	0.97	0.42	2.19*
Piper	Public	3.0	94	33.0	45	41	35	0.85	0.82	0.49	2.16*
Hayking BMR	Cal/West Seeds	2.0	63	33.3	39	39	36	0.63	0.84	0.55	2.02*
Experimental Varieties											
CW5-43-29 BMR	Cal/West Seeds	2.8	75	33.3	47	46	27	0.79	1.15	0.47	2.41*
CW5-43-43 BMR	Cal/West Seeds	2.5	61	33.3	45	46	29	0.82	1.12	0.44	2.38*
CW5-43-68 BMR	Cal/West Seeds	2.8	65	33.3	42	43	29	0.81	1.07	0.49	2.37*
CW5-43-33 BMR	Cal/West Seeds	2.5	76	33.3	47	46	30	0.86	1.11	0.39	2.36*
CW5-43-34 BMR	Cal/West Seeds	2.1	68	33.0	42	45	27	0.78	1.03	0.44	2.26*
CW5-43-50 BMR	Cal/West Seeds	2.3	65	33.3	42	43	24	0.74	0.94	0.39	2.07*
CW5-43-69 BMR	Cal/West Seeds	1.4	46	33.0	39	41	24	0.67	0.87	0.31	1.85
Mean		2.5	71	33.3	44	43	30	0.79	0.99	0.46	2.23
CV,%		22.8	15	1.4	10	9	15	16.81	21.64	20.65	15.52
LSD,0.05		0.8	15	0.7	6	5	7	0.19	0.31	0.14	0.80

[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 2 for complete scale.
*Not significantly different from the highest numerical value in the column, based on the 0.05 LSD.
Nitrogen application: 50# on June 3 and 50# on July 7.

Summary

Summer annual grasses can be an important supplemental source of pasture, hay, and silage in Kentucky. Varieties should be selected for their seasonal and total yield characteristics and for their suitability for the method of harvest to be employed (pasture, hay, or silage). Make sure seed of the chosen variety is properly labeled and will be available when needed.

The following is a list of University of Kentucky Cooperative Extension publications related to ryegrass management. They are available from your county Extension office and are listed in the "Publications" section of the UK Forage Web site, www.uky.edu/Ag/Forage.

- Lime and Fertilizer Recommendations (AGR-1)
- Grain and Forage Crop Guide for Kentucky (AGR-18)
- Establishing Forage Crops (AGR-64)
- Producing Summer Annual Grasses for Emergency or Supplemental Forage (AGR-88)
- Forage Identification and Use Guide (AGR-175)
- Extending Grazing and Reducing Stored Feed Needs (AGR-199)

About the Authors

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Table 5. Dry matter yields, percent stand, seedling vigor, maturity and stand height of sudangrass varieties sown May 25, 2011, at Lexington, Kentucky.

Variety	Proprietor/ Distributor	Seedling Vigor[1] Jun16	Percent Stand Jun 16	Maturity[2]		Plant Height *(inches)*				Yield *(tons/acre)*				
				Jun 27	Jul 18	Jun 27	Jul18	Aug 8	Sep 20	Jun 28	Jul 18	Aug 8	Sep 20	Total
Commercial Varieties—Available for Farm Use														
ProMax BMR	Ampac Seed	4.5	99	2.3	2.5	34	41	44	42	0.53	1.05	1.17	0.80	3.54*
SS130 BMR	Cal/West Seeds	3.8	99	1.5	2.0	27	33	38	29	0.49	1.00	1.02	0.67	3.18*
Monarch V	Public	5.0	100	2.0	1.3	33	32	33	29	0.64	0.94	0.81	0.62	3.01*
Hayking BMR	Cal/West Seeds	3.5	97	1.8	3.0	26	41	40	32	0.38	0.92	1.03	0.67	3.00*
Enorma BMR	Cal/West Seeds	3.3	97	1.3	2.3	25	37	41	32	0.37	0.92	0.96	0.66	2.91
Piper	Public	4.8	100	2.0	1.8	33	34	36	30	0.52	0.96	0.88	0.55	2.90
Mean		4.1	99	1.8	2.1	30	36	39	32	0.49	0.96	0.98	0.66	3.09
CV,%		11.6	1	25.5	37.4	12	10	10	21	20.12	10.17	14.16	22.80	13.19
LSD,0.05		0.7	2	0.7	1.2	5	6	6	10	0.15	0.15	0.21	0.23	0.61

[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 2 for complete scale.
*Not significantly different from the highest numerical value in the column, based on the 0.05 LSD.
Nitrogen application: 30# on June 2, 60# on June 28, and 40# on July 18.

Table 6. Dry matter yields, seedling vigor, percent stand, maturity, and stand height of sudangrass varieties sown May 10, 2012, at Lexington, Kentucky.

Variety	Proprietor/ Distributor	Seedling Vigor[1] Jun 4	Percent Stand Jun 4	Maturity[2]				Plant Height *(inches)*				Yield *(tons/acre)*				
				Jun 21	Jul 24	Aug 13	Sep 27	Jun 21	Jul 24	Aug 13	Sep 27	Jun 21	Jul 24	Aug 13	Sept 27	Total
Commercial Varieties—Available for Farm Use																
AS9301 BMR	Alta Seeds/ Ramer Seeds	3.6	96	30.8	45.0	31.3	54.8	34	38	29	41	0.87	0.96	0.94	1.41	4.19*
Piper	Public	5.0	100	32.5	54.0	32.5	46.3	44	43	32	35	0.99	1.00	0.86	0.86	3.71
Hayking BMR	Cal/West Seeds	3.1	98	32.0	57.0	32.3	50.5	40	44	32	38	0.83	0.97	0.86	0.81	3.46
ProMax BMR	Ampac Seed	3.1	98	32.5	59.0	33.3	50.8	41	44	32	37	0.78	0.97	0.81	0.87	3.43
Monarch V	Cal/West Seeds	4.0	100	32.0	47.8	32.3	48.0	40	38	29	32	0.86	0.92	0.71	0.81	3.30
Enorma BMR	Cal/West Seeds	2.8	97	32.0	46.3	32.3	50.3	35	40	30	38	0.73	0.97	0.83	0.74	3.27
Experimental Varieties																
CW5-43-29	Cal/West Seeds	3.0	97	32.0	59.0	32.8	59.5	40	48	36	43	0.79	1.04	0.93	0.99	3.75
CW6-43-50	Cal/West Seeds	3.4	99	32.3	60.5	33.3	53.8	38	47	33	38	0.78	1.00	0.83	0.97	3.59
Mean		3.5	98	32.0	53.6	32.5	51.7	39	43	32	38	0.83	0.98	0.85	0.93	3.59
CV,%		14.0	2	2.4	7.1	2.9	8.8	6	9	9	11	9.03	8.38	9.72	16.27	6.99
LSD,0.05		0.7	3	1.1	5.6	1.4	6.7	4	5	4	6	0.11	0.12	0.12	0.22	0.37

[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 2 for complete scale.
*Not significantly different from the highest numerical value in the column, based on the 0.05 LSD.
Nitrogen application: 60# on May 11, 50# on July 26 and 50# on August 14.
Rainfall deficit: May-August rainfall was 10.62 inches; rainfall deficit during this period in 2012 was -6.44 inches.

Table 7. Dry matter yields, seedling vigor, percent stand, maturity, and stand height of sudangrass varieties sown May 28, 2013, at Lexington, Kentucky.

Variety	Proprietor/ Distributor	Seedling Vigor[1] Jun 20	Percent Stand Jun 20	Maturity[2]			Plant Height *(inches)*				Yield *(tons/acre)*				
				Jul 8	Aug 7	Sep 9	Jul 8	Aug 7	Sep 9	Oct 21	Jul 8	Aug 7	Sep 9	Oct 21	Total
Commercial Varieties—Available for Farm Use															
SS130 BMR	Cal/West Seeds	4.6	97	32.0	33.3	42.3	43	49	50	16	1.37	1.74	1.69	0.39	5.19*
Piper	Public	4.8	99	32.3	33.5	33.8	46	58	54	24	1.37	1.69	1.53	0.47	5.07*
ProMax BMR	Ampac Seed	4.4	96	32.3	34.0	36.8	44	60	57	20	1.35	1.73	1.52	0.38	4.98*
Monarch V	Public	5.0	99	32.3	33.3	36.3	44	52	46	17	1.40	1.66	1.37	0.33	4.76*
Hayking BMR	Cal/West Seeds	3.9	95	32.0	33.8	39.5	44	55	52	21	1.18	1.60	1.52	0.36	4.66*
Enorma BMR	Cal/West Seeds	3.5	97	32.0	33.5	42.3	40	53	53	17	1.17	1.50	1.44	0.28	4.39
Mean		4.4	97	32.1	33.5	38.5	43	54	52	19	1.31	1.65	1.51	0.37	4.84
CV,%		11.5	3	1.1	1.8	13.2	8	10	7	9	17.19	12.86	7.64	17.29	9.62
LSD,0.05		0.8	4	0.5	0.9	7.6	5	9	6	3	0.34	0.32	0.17	0.10	0.70

[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 2 for complete scale.
*Not significantly different from the highest numerical value in the column, based on the 0.05 LSD.
Nitrogen application: 50# on July 22 and Aug. 8.

Table 8. Dry matter yields, seedling vigor, percent stand, maturity, and stand height of sorghum-sudangrass varieties sown May 29, 2009, at Lexington, Kentucky.

Variety	Proprietor/ Distributor	Seedling Vigor[1] Jun 14	Percent Stand Jun 14	Maturity[2] Jul 15	Plant Height *(inches)*			Yield *(tons/acre)*				
					Jul 15	Aug 14	Sep 16	Jul 15	Aug 14	Sep 16	Oct 19	Total
Commercial Varieties—Available for Farm Use												
Special Effort	Cisco	3.4	98	34.3	68	45	36	1.84	1.11	0.71	0.16	3.82*
SS220 BMR	Southern States	2.5	93	34.0	69	47	35	1.79	1.07	0.65	0.22	3.73*
HyGain	Turner Seed	3.3	95	34.0	68	50	38	1.76	1.18	0.62	0.11	3.66*
NutraPlus BMR	Cisco	2.3	84	33.0	60	41	35	1.48	1.02	0.68	0.20	3.39
Surpass BMR-6	Turner Seed	3.0	93	32.3	50	32	30	1.46	0.59	0.59	0.16	2.80
Experimental Varieties												
AMP-SGII BMR	Ampac Seed	3.9	95	33.5	68	50	38	1.99	1.18	0.72	0.15	4.05*
AMP-R52537 BMR	Ampac Seed	4.3	96	34.0	74	45	32	2.05	1.09	0.57	0.11	3.82*
AMP-SPS	Ampac Seed	4.8	99	32.0	59	32	38	1.97	0.70	0.76	0.22	3.65*
AMP-R40352	Ampac Seed	3.5	90	34.0	69	45	36	1.74	1.01	0.62	0.20	3.57
AMP-R82400 BMR	Ampac Seed	2.8	95	32.8	62	38	33	1.82	0.77	0.62	0.14	3.36
AMP-R38327 BMR	Ampac Seed	4.8	100	32.3	53	30	24	1.78	0.63	0.52	0.21	3.13
Mean		3.5	94	33.3	63	41	34	1.79	0.94	0.64	0.17	3.54
CV,%		17.5	4	1.8	4	6	12	9.25	13.41	18.68	37.76	7.96
LSD,0.05		0.9	6	0.8	4	4	6	0.24	0.18	0.17	0.09	0.41

[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 2 for complete scale.
*Not significantly different from the highest numerical value in the column, based on the 0.05 LSD.
Nitrogen application: 60# on June 9 and 25# on July 17.

Table 9. Dry matter yields, seedling vigor, percent stand, maturity, and stand height of sorghum-sudangrass varieties sown May 27, 2010, at Lexington, Kentucky.

Variety	Propietor/ Distributor	Seedling Vigor[1] Jun 11	Percent Stand Jun 11	Maturity[2]		Plant Height *(inches)*			Yield *(tons/acre)*			
				Jun 28	Jul 27	Jun 28	Jul 27	Sep 1	Jun 28	Jul 27	Sep 1	Total
Commercial Varieties—Available for Farm Use												
Greengrazer V	Farm Science Genetics	4.8	91	32.0	33.8	59	68	57	1.58	1.67	1.50	4.75*
HyGain	Turner Seed	3.3	91	31.5	33.3	44	64	53	0.92	1.41	1.03	3.36
MS 202 BMR	Farm Science Genetics	3.0	79	31.5	32.8	42	63	50	0.94	1.19	0.90	3.03
NutraPlus BMR	Cisco	3.6	76	31.0	33.3	39	57	39	0.89	1.08	0.72	2.69
Special Effort	Cisco	2.4	78	31.5	32.8	38	57	45	0.88	0.95	0.80	2.65
SS220 BMR	Southern States	2.4	56	31.5	32.8	40	62	42	0.72	1.05	0.64	2.41
FSG 208 BMR	Farm Science Genetics	2.8	86	31.3	32.3	37	50	36	0.72	0.86	0.55	2.13
Surpass BMR-6	Turner Seed	2.9	76	30.0	31.8	31	39	27	0.67	0.82	0.35	1.84
Experimental Varieties												
AS2	Allied Seed, L.L.C.	4.4	88	32.0	33.8	57	66	54	1.44	1.49	1.03	3.95*
ASPS	Allied Seed, L.L.C.	3.3	89	31.0	31.0	39	54	42	1.03	1.17	0.72	2.92
AS1 BMR	Allied Seed, L.L.C.	4.3	91	31.3	31.8	40	38	23	1.08	0.65	0.27	2.00
Mean		3.4	82	31.3	32.6	42	56	42	0.99	1.12	0.78	2.89
CV,%		17.5	10	1.7	2.2	10	9	13	22.65	21.83	36.00	23.74
LSD,0.05		0.8	12	0.8	1.1	6	7	6	0.33	0.35	0.40	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 2 for complete scale.
*Not significantly different from the highest numerical value in the column, based on the 0.05 LSD.
Nitrogen application: 50# on June 3 and 50# on June 29

Table 10. Dry matter yields, percent stand, seedling vigor, maturity, and stand height of sorghum-sudangrass varieties sown May 25, 2011, at Lexington, Kentucky.

Variety	Proprietor/ Distributor	Seedling Vigor[1] Jun 16	Percent Stand Jun 16	Maturity[2]		Plant Height *(inches)*				Yield *(tons/acre)*				
				Jun 30	Jul 22	Jun 30	Jul 22	Aug 15	Sep 20	Jun 30	Jul 22	Aug 15	Sep 20	Total
Commercial Varieties—Available for Farm Use														
Sweet-For-Ever	Gayland Ward Seed	3.5	100	30.0	32.3	30	44	33	29	0.59	1.80	1.12	0.88	4.38*
SS211	Southern States	3.8	96	31.0	32.8	40	49	44	29	0.68	1.58	1.22	0.67	4.15*
NutraPlus BMR	Cisco	5.0	100	30.3	31.8	36	35	33	24	0.84	1.44	1.17	0.64	4.10*
Super Sugar	Gayland Ward Seed	4.3	97	31.0	32.8	40	48	45	29	0.70	1.51	1.17	0.72	4.09*
Special Effort	Cisco	3.8	77	30.8	32.8	36	44	38	28	0.67	1.42	1.10	0.58	3.77*
GW300BMR	Gayland Ward Seed	3.3	93	30.3	32.5	34	44	37	25	0.55	1.44	1.01	0.54	3.53
Mean		3.9	94	30.5	32.5	36	44	39	27	0.67	1.53	1.13	0.67	4.00
CV,%		10.4	19	1.1	1.9	5	9	6	7	9.56	12.09	14.14	13.81	10.36
LSD,0.05		0.6	27	0.5	0.9	3	6	3	3	0.10	0.28	0.24	0.14	0.63

[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 2 for complete scale.
*Not significantly different from the highest numerical value in the column, based on the 0.05 LSD.
Nitrogen application: 30# on June 2, 60# on July 1, 40# on July 27 and 40# on Aug. 19.

Table 11. Dry matter yields, seedling vigor, percent stand, maturity, and stand height of sorghum-sudangrass and pearl millet (PM) varieties sown May 10, 2012, at Lexington, Kentucky.

Variety	Proprietor/ Distributor	Seedling Vigor[1] Jun 4	Percent Stand Jun 4	Maturity[2]			Plant Height *(inches)*			Yield *(tons/acre)*			
				Jun 27	Jul 30	Sep 27	Jun 27	Jul 30	Sep 27	Jun 27	Jul 30	Sep 27	Total
Commercial Varieties—Available for Farm Use													
Vita-Cane	Gayland Ward Seed	4.8	100	31.3	44.0	62.0	38	38	44	0.90	1.20	1.52	3.61*
Super Sugar	Gayland Ward Seed	4.6	98	31.0	44.5	62.0	38	38	53	0.77	1.17	1.55	3.49*
Special Effort	Cisco	4.4	96	31.0	50.5	60.0	37	39	44	0.80	1.08	1.56	3.44*
SS220 BMR	Southern States	3.0	64	31.0	37.8	54.0	32	48	47	0.48	1.28	1.59	3.35*
Sweet-For-Ever	Gayland Ward Seed	4.6	99	31.0	31.5	46.0	28	39	40	0.63	1.21	1.38	3.21*
NutraPlus BMR	Cisco	4.6	93	30.5	50.8	56.0	34	44	41	0.69	1.32	1.16	3.17*
SS211	Southern States	2.9	53	31.0	43.5	47.8	29	50	44	0.39	1.08	1.32	2.79
AS6402 BMR	Alta Seeds/Ramer Seed	3.8	75	30.0	32.0	53.0	26	38	34	0.46	1.10	1.17	2.73
Pennleaf Hybrid (PM)	Pennington Seed	2.0	99	29.0	38.8	75.0	17	24	27	0.36	0.96	1.28	2.59
GW 2120	Gayland Ward Seed	4.0	97	31.0	36.8	46.8	27	33	28	0.64	1.12	0.73	2.48
Sweet-For-Ever BMR	Gayland Ward Seed	3.4	93	30.5	32.3	42.0	27	41	29	0.50	0.96	0.87	2.33
GW 300 BMR	Gayland Ward Seed	3.9	91	30.5	42.0	47.3	30	46	34	0.49	1.10	0.74	2.33
PP102M Hybrid (PM)	Cisco	2.0	97	29.5	60.0	75.0	19	41	37	0.35	0.88	0.83	2.05
Tifleaf III Hybrid (PM)	Gayland Ward Seed	2.4	100	29.5	58.5	75.0	19	37	37	0.31	0.87	0.80	1.98
Mean		3.6	89	30.5	43.1	57.5	28	40	38	0.55	1.10	1.18	2.83
CV,%		13.3	7	2.3	17.9	9.4	11	12	18	29.35	14.32	26.34	18.62
LSD,0.05		0.7	9	1.0	11.0	7.9	5	7	10	0.23	0.22	0.44	0.75

[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 2 for complete scale.
*Not significantly different from the highest numerical value in the column, based on the 0.05 LSD.
Nitrogen application: 60# on May 11 and 60# on August 7.
Rainfall deficit: May-August rainfall was 10.62 inches; rainfall deficit during this period in 2012 was -6.44 inches.

Table 12. Dry matter yields, seedling vigor, percent stand, maturity, and stand height of sorghum-sudangrass varieties sown May 28, 2013, at Lexington, Kentucky.

Variety	Proprietor/ Distributor	Seedling Vigor[1] Jun 20	Percent Stand Jun 20	Maturity[2]			Plant Height *(inches)*				Yield *(tons/acre)*				
				Jul 8	Aug 7	Sep 9	Jul 8	Aug7	Sep 9	Oct 21	Jul 8	Aug 7	Sep 9	Oct 21	Total
Commercial Varieties—Available for Farm Use															
Greengrazer V	Farm Science Genetics	5.0	100	31.5	32.5	33.0	53	50	52	18	1.76	1.79	2.11	0.53	6.19*
Special Effort	Cisco	4.9	100	31.5	31.8	36.5	50	50	52	19	1.75	1.60	2.14	0.62	6.11*
SS211	Southern States	4.5	94	31.3	32.0	33.3	49	47	56	17	1.64	1.54	2.12	0.49	5.78*
NutraPlus BMR	Cisco	5.0	100	31.5	30.5	32.8	45	37	48	14	1.87	1.27	1.84	0.54	5.53*
SuperSugar	Gayland Ward Seed	4.8	97	31.8	32.5	33.5	50	52	51	19	1.59	1.53	1.82	0.50	5.45*
FSG214 BMR6	Farm Science Genetics	4.8	90	31.5	32.5	36.0	45	49	47	13	1.66	1.38	1.62	0.39	5.04
AS6503 BMR6	Alta Seeds/Ramer Seed	4.5	100	30.8	26.5	31.8	38	32	36	11	1.75	1.15	1.71	0.26	4.87
SweetSix BMR	Gayland Ward Seed	4.9	100	31.5	32.3	33.0	47	44	45	16	1.70	1.28	1.41	0.33	4.71
GW 300 BMR	Gayland Ward Seed	3.0	84	30.8	31.5	32.5	42	42	51	16	1.27	1.26	1.58	0.37	4.48
Sweet-for-Ever	Gayland Ward Seed	2.3	74	31.0	30.5	32.0	36	45	43	15	0.96	1.42	1.47	0.28	4.14
Sweet-for-Ever BMR	Gayland Ward Seed	3.5	90	30.5	30.0	31.3	36	36	35	12	1.23	0.99	1.13	0.21	3.56
Mean		4.3	93	31.2	31.1	31.2	44	44	47	15	1.56	1.38	1.72	0.41	5.08
CV,%		9.2	8	1.9	5.8	7.3	6	11	11	9	10.82	12.79	14.00	22.74	10.56
LSD,0.05		0.6	11	0.8	2.6	3.5	4	7	7	2	0.24	0.26	0.35	0.14	0.77

[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 2 for complete scale.
*Not significantly different from the highest numerical value in the column, based on the 0.05 LSD.
Nitrogen application: 50# on July 22 and Aug. 8.

Table 13. Dry matter yields, seedling vigor, maturity, and percent stand of teff varieties sown May 29, 2009, at Lexington, Kentucky.

Variety[3]	Seedling Vigor[1] Jun 14	Percent Stand Jun 14	Maturity[2] Jul 15	Yield *(tons/acre)*				
				Jul 15	Aug 17	Sep 16	Oct 19	Total
Commercial Varieties—Available for Farm Use								
Highveld	3.3	99	50.3	1.65	1.00	0.27	0.34	3.26*
Rooiberg	4.1	100	56.0	1.39	1.01	0.27	0.27	2.95*
HorseCandi	2.9	99	51.8	1.72	0.82	0.11	0.18	2.84*
Excaliber	3.5	100	55.0	1.51	0.94	0.15	0.20	2.80
Corvallis	4.3	100	51.3	1.70	0.76	0.08	0.20	2.74
Witkope	3.8	100	56.0	1.71	0.84	0.08	0.09	2.73
Velvet	4.6	100	52.8	1.57	0.90	0.14	0.08	2.69
VA-T1 Brown	4.0	100	51.5	1.57	0.87	0.10	0.11	2.66
Tiffany	3.1	99	52.0	1.37	0.89	0.09	0.14	2.50
Dessie	4.0	100	48.5	1.42	0.74	0.20	0.13	2.49
Summer Delight	3.3	99	54.5	1.51	0.77	0.07	0.11	2.47
Pharaoh	3.4	100	47.5	1.40	0.79	0.03	0.09	2.30
Mean	3.7	100	52.3	1.54	0.86	0.13	0.16	2.70
CV,%	23.2	2	5.5	13.46	15.74	43.86	44.74	11.02
LSD,0.05	1.2	2	4.1	0.30	0.20	0.09	0.10	0.43

[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 2 for complete scale.
[3] Check with local dealer for available varieties.
*Not significantly different from the highest numerical value in the column, based on the 0.05 LSD.
Nitrogen application: 60# on June 9 and 25# on July 17.

Table 14. Dry matter yields, seedling vigor, and percent stand of teff varieties sown May 27, 2010, at Lexington, Kentucky.

Variety[2]	Seedling Vigor[1] Jun 11	Percent Stand Jun 11	Yield *(tons/acre)*			
			Jul 7	Jul 30	Sep 28	Total[3]
Commercial Varieties—Available for Farm Use						
Excaliber	3.1	95	0.71	1.00	0.42	2.14*
Witkope	3.1	92	0.60	0.90	0.46	1.96*
Rooiberg	2.4	91	0.67	0.85	0.42	1.94*
Pharaoh	3.5	98	0.69	0.87	0.26	1.81*
Highveld	2.5	94	0.60	0.82	0.38	1.81*
Velvet	4.0	98	0.62	0.81	0.24	1.66*
Dessie	2.8	79	0.63	0.87	0.15	1.65*
Summer Delight	4.1	96	0.62	0.82	0.21	1.65
Corvallis	3.3	93	0.61	0.70	0.25	1.56*
HorseCandi	2.8	94	0.50	0.69	0.33	1.52*
VA-T1Brown	3.4	96	0.47	0.78	0.24	1.49*
Tiffany	3.1	92	0.59	0.68	0.14	1.41
Mean	3.2	93	0.61	0.82	0.29	1.71
CV,%	32.9	13	26.65	33.38	43.97	27.18
LSD,0.05	1.5	16	0.23	0.39	0.18	0.67

[1] Vigor score based on a scale of 1 to 5 with 5 being the most vigorous seedling growth.
[2] Check with local dealer for available varieties.
[3] There was heavy weed pressure from annual grasses and the weather was very dry, therefore the result was reduced yields.
*Not significantly different from the highest numerical value in the column, based on the 0.05 LSD.
Nitrogen application: 30# on June 3 and 50# on July 7.

Table 15. Dry matter yields, seedling vigor, percent stand, maturity, and stand height of teff varieties sown May 25, 2011, at Lexington, Kentucky.

Variety[3]	Seedling Vigor[1] Jun 16	Percent Stand Jun 16	Maturity[2]		Plant Height *(inches)*	Yield *(tons/acre)*				
			Jul 7	Jul 22	Jul 7	Jul 7	Jul 22	Aug 15	Sep 27	Total
Commercial Varieties—Available for Farm Use										
Rooiberg	4.5	100	57.0	57.0	23	0.71	1.09	1.18	0.71	3.70*
Excaliber	4.0	100	55.0	56.0	25	0.62	1.02	1.12	0.89	3.65*
HorseCandi	4.0	99	47.5	51.3	21	0.71	0.99	1.06	0.88	3.64*
Pharaoh	4.9	100	44.5	53.5	23	0.78	0.97	1.03	0.78	3.56*
Witkope	4.0	100	55.5	56.0	24	0.69	1.11	0.97	0.70	3.47*
Corvallis	4.8	100	51.3	53.0	22	0.63	0.95	1.09	0.75	3.42*
Highveld	3.8	100	42.8	53.5	20	0.47	1.02	1.01	0.89	3.39*
Velvet	4.4	100	50.8	53.0	22	0.56	0.99	0.96	0.79	3.31*
Dessie	3.3	99	42.3	54.0	21	0.46	1.02	0.94	0.73	3.16*
Tiffany	4.0	100	46.5	54.5	19	0.41	1.00	0.96	0.78	3.14*
VA-T1Brown	4.8	100	48.0	52.0	20	0.45	0.95	1.00	0.68	3.07
Summer Delight	3.3	99	48.8	54.0	17	0.44	0.93	0.91	0.70	2.98
Mean	4.1	100	49.1	54.0	21	0.58	1.00	1.02	0.77	3.37
CV,%	18.4	1	9.9	3.4	13	46.81	8.95	11.59	16.40	12.33
LSD,0.05	1.1	1	7.0	2.6	4	0.39	0.13	0.17	0.18	0.60

[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 2 for complete scale.
[3] Check with local dealer for available varieties.
*Not significantly different from the highest numerical value in the column, based on the 0.05 LSD.
Nitrogen application: 30# on June 2, 40# on July 7, 40# on July 27, and 30# on Aug. 19.

Table 16. Dry matter yields, seedling vigor, percent stand, and maturity of teff varieties sown May 10, 2012, at Lexington, Kentucky.

Variety[3]	Seedling Vigor[1] Jun 4	Percent Stand Jun 4	Maturity[2]			Yield *(tons/acre)*				
			Jun 27	Jul 25	Aug 10	Jun 27	Jul 25	Aug 10	Sept 27	Total
Commercial Varieties—Available for Farm Use										
Rooiberg	4.0	100	57.0	60.0	57.5	0.90	0.40	0.84	1.08	3.21*
Highveld	4.1	99	52.5	59.0	55.0	0.77	0.41	0.77	1.11	3.05*
Excaliber	4.1	100	54.5	59.0	56.5	0.77	0.38	0.72	1.08	2.95*
Tiffany	4.3	100	48.5	56.5	52.0	0.74	0.34	0.73	1.05	2.85*
Witkope	3.8	99	56.0	57.0	56.0	0.68	0.34	0.75	1.04	2.82*
Pharaoh	4.1	100	46.3	52.8	49.8	0.64	0.29	0.73	1.05	2.71
Corvalis	4.4	100	47.5	56.0	51.3	0.63	0.34	0.72	1.00	2.68
Dessie	3.6	100	52.0	57.0	54.0	0.56	0.34	0.70	1.05	2.66
Velvet	3.9	100	53.5	58.0	54.0	0.58	0.32	0.74	1.01	2.65
VA-T1Brown	4.4	100	50.3	53.0	46.8	0.58	0.35	0.71	1.00	2.63
HorseCandi	3.9	100	48.0	55.0	50.3	0.60	0.27	0.71	1.04	2.63
SummerDelight	4.1	100	51.5	57.5	51.0	0.54	0.29	0.72	1.04	2.60
Experimental Varieties										
F-11	3.5	99	46.8	55.5	54.0	0.53	0.26	0.64	0.90	2.33
Mean	4.0	100	51.1	56.6	52.9	0.66	0.33	0.73	1.04	2.75
CV,%	19.8	1	5.4	3.6	4.1	29.04	21.35	11.73	10.51	12.07
LSD,0.05	1.1	1	3.9	2.9	3.1	0.27	0.10	0.12	0.16	0.48

[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 2 for complete scale.
[3] Check with local dealer for available varieties.
*Not significantly different from the highest numerical value in the column, based on the 0.05 LSD.
Nitrogen application: 40# on May 11, 50# on July 26, and 30# on August 14.
Rainfall deficit: May-August rainfall was 10.62 inches; rainfall deficit during this period in 2012 was -6.44 inches.

Table 17. Dry matter yields, seedling vigor, percent stand, and maturity of teff varieties sown May 28, 2013, at Lexington, Kentucky.

Variety[3]	Seedling Vigor[1] Jun 20	Percent Stand Jun 20	Maturity[2]		Yield *(tons/acre)*				
			Jul 17	Aug 7	Jul 17	Aug 7	Sept 9	Oct 21	Total
Commercial Varieties—Available for Farm Use									
Witkope	2.4	93	56.0	49.0	1.98	1.20	1.12	0.61	4.90*
Excaliber	3.4	99	52.5	51.5	1.99	1.17	1.18	0.54	4.87*
Highveld	3.1	98	49.8	32.0	1.94	0.96	1.47	0.48	4.86*
Velvet	2.6	98	53.0	40.8	2.15	1.04	1.11	0.55	4.84*
Rooiberg	2.8	97	56.0	48.8	2.09	1.07	1.24	0.44	4.83*
Pharaoh	3.3	99	45.0	35.3	2.03	1.14	1.09	0.52	4.78*
Corvalis	2.5	98	48.0	38.5	1.95	1.09	1.18	0.51	4.73*
SummerDelight	3.9	99	48.0	35.3	2.14	1.04	1.04	0.51	4.72*
VA-T1Brown	2.9	99	51.3	37.0	2.10	1.03	1.08	0.38	4.60*
Tiffany	2.9	100	49.0	32.0	1.95	1.08	1.02	0.55	4.60*
Dessie	2.6	95	54.0	43.0	1.88	1.04	1.17	0.49	4.59*
HorseCandi	2.0	95	49.8	40.3	2.01	1.09	0.98	0.47	4.56*
Moxie	2.6	97	53.5	33.8	2.04	0.93	1.02	0.45	4.45*
Experimental Varieties									
F11	2.8	100	46.3	37.0	2.08	1.04	1.00	0.56	4.67*
Mean	2.8	98	50.9	39.6	2.02	1.07	1.12	0.50	4.21
CV,%	43.0	4	6.0	16.3	8.12	13.47	19.82	20.51	9.02
LSD,0.05	1.7	6	4.3	9.2	0.23	0.21	0.32	0.15	0.61

[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 2 for complete scale.
[3] Check with local dealers for available varieties.
*Not significantly different from the highest numerical value in the column, based on the 0.05 LSD.
Nitrogen application: 40# on June 5 and 50# on July 22 and Aug. 8.

Table 18. Dry matter yields, seedling vigor, percent stand, and maturity of pearl millet varieties sown May 28, 2013, at Lexington, Kentucky.

Variety	Proprietor/ Distributor	Seedling Vigor[1] Jun 20	Percent Stand Jun 20	Maturity[2]			Plant Height *(inches)*				Yield *(tons/acre)*				
				Jul 12	Aug 7	Sep 9	Jul 12	Aug 7	Sep 9	Oct 21	Jul 15	Aug 7	Sep 9	Oct 21	Total
Commercial Varieties—Available for Farm Use															
Tifleaf III Hybrid	Gayland Ward Seed	4.8	99	30.0	48.5	64	32	35	45	21	1.64	1.65	2.26	0.62	6.16*
SS635	Southern States	3.5	89	29.5	37.0	64	32	32	47	22	1.61	1.39	2.19	0.55	5.74*
Pennleaf Hybrid	Pennington Seed	2.5	74	30.0	46.3	64	30	34	43	19	1.47	1.29	1.75	0.44	4.95*
PP102M Hybrid	Cisco	2.3	74	29.5	46.3	64	34	33	53	19	1.59	1.16	1.84	0.35	4.93*
SS501	Southern States	3.0	76	30.0	33.3	64	42	32	59	21	1.57	1.08	1.84	0.31	4.80*
Mean		3.2	82	29.8	42.3	64	34	33	49	21	1.58	1.31	1.97	0.45	5.32
CV,%		32.7	10	4.1	19.7	0	11	6	9	15	25.54	11.75	16.09	23.58	17.04
LSD,0.05		1.6	13	1.9	12.8	0	6	3	7	5	0.62	0.24	0.49	0.23	1.40

[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 2 for complete scale.
*Not significantly different from the highest numerical value in the column, based on the 0.05 LSD.
Nitrogen application: 50# on July 22 and Aug. 8.

Table 19. Dry matter yields, seedling vigor, percent stand, heading date, harvest height, and harvest date of forage sorghum varieties sown May 28, 2013, at Lexington, Kentucky.

Variety	Proprietor/Distributor	Seedling Vigor[1] Jun 20	Percent Stand Jun 20	Heading Date[2]	Harvest Height *(feet)*	Harvest Date[3]	Yield *(tons/acre)*
Commercial Varieties—Available for Farm Use							
Ensilemaster	Caudill Seed	2.6	81	Aug 22	10.6	Sept 10	10.41*
GW2120	Gayland Ward Seed	3.5	91	Aug 13	9.4	Sept 6	9.77*
GW400BMR	Gayland Ward Seed	3.5	87	Aug 13	9.9	Sept 6	7.81
AF7201BMR6	Alta Seeds/Ramer Seed	4.0	90	Aug 9	9.8	Aug 27	7.45
AF7401BMR6	Alta Seeds/Ramer Seed	4.9	98	Aug 21	6.5	Sept 10	6.36
Experimental Varieties							
Exp10074	Gayland Ward Seed	4.9	97	Aug 2	10.6	Aug 27	8.49
Mean		3.9	91		9.5		8.38
CV,%		11.4	6		3.0		12.63
LSD,0.05		0.7	8		0.4		1.60

[1] Vigor score based on a scale of 1 to 5 with 5 being the most vigorous seedling growth
[2] Approximately 50% of heads fully emerged.
[3] Harvested at soft dough stage.
*Not significantly different from the highest numerical value in the column, based on the 0.05 LSD.

Table 20. Summary of Kentucky sudangrass yield trials 2008-2013 (yield shown as a percentage of the mean of the commercial varieties in the trial).

Variety	Proprietor/KY Distributor	Lexington						Mean[3] *(#trials)*
		2008[1,2]	2009	2010	2011	2012	2013	
		All trials are 1 year yields						
AS9301 BMR	Alta Seeds/Ramer Seed					118		–
Enorma BMR	Cal/West Seeds			99	94	92	91	94(4)
Hayking BMR	Central Farm Supply	111	112	91	97	97	96	101(6)
Monarch V	Public	104	96	102	97	93	98	98(6)
Piper	Public	90	91	97	94	104	105	97(6)
ProMax BMR	Ampac Seed	95	101	110	115	96	103	103(6)
SS130 BMR	Cal/West Seeds			101	103		107	104(3)

[1] Establishment year.
[2] Use this summary table as a guide in making variety decisions, but refer to specific tables in this report to determine statistical differences in forage yield between varieties.
[3] Mean only presented when respective variety was included in two or more trials.

Table 21. Summary of Kentucky sorghum-sudangrass yield trials 2008-2013 (yield shown as a percentage of the mean of the commercial varieties in the trial).

Variety	Proprietor/KY Distributor	Lexington						
		2008[1,2]	2009	2010	2011	2012	2013	Mean[3]
		All trials are 1 year yields						*(#trials)*
AS6402 BMR	Alta Seeds/Ramer Seed					91		–
AS6503 BMR6	Alta Seeds/Ramer Seed						96	–
FSG 208 BMR	Farm Science Genetics			75				–
FSG 214 BMR6	Farm Science Genetics						99	–
Greengrazer V	Farm Science Genetics			166			122	144(2)
GW300 BMR	Gayland Ward Seed				88	78	88	85(3)
HyGain	Turner Seed	104	105	118				109(3)
MS 202 BMR	Farm Science Genetics			106				–
NutraPlus BMR	Cisco	106	97	94	103	106	109	103(6)
Special Effort	Cisco	109	110	93	94	115	120	107(6)
SS211	Southern States				104	93	114	104(3)
SS220 BMR	Southern States		107	84		112		101(3)
Surpass BMR-6	Turner Seed	81	80	64				75(3)
Super Sugar	Gayland Ward Seed				102	117	107	109(3)
Sweet-For-Ever	Gayland Ward Seed				110	107	81	99(3)
Sweet-For-Ever BMR	Gayland Ward Seed					78	70	74(2)
SweetSix BMR	Gayland Ward Seed						93	–
Vita-Cane	Gayland Ward Seed					121		–

[1] Establishment year.
[2] Use this summary table as a guide in making variety decisions, but refer to specific tables in this report to determine statistical differences in forage yield between varieties.
[3] Mean only presented when respective variety was included in two or more trials.

Table 22. Summary of Kentucky teff yield trials 2008-2013 (yield shown as a percentage of the mean of the commercial varieties in the trial).

Variety	Princeton		Lexington						
	2008[1,2]	2009	2008	2009	2010	2011	2012	2013	Mean[3]
	All trials are 1 year yields								*(#trials)*
Corvallis	94	112	81	101	91	101	96	100	97(8)
Dessie	102	87	99	92	96	94	95	97	95(8)
Excaliber	109	111	109	104	125	108	106	103	109(8)
Highveld	111	115	100	121	106	101	109	103	108(8)
HorseCandi	91	84	99	105	89	108	94	97	96(8)
Moxie								94	–
Pharaoh	95	101	105	85	106	106	97	101	100(8)
Rooiberg	102	107	112	109	113	108	115	102	109(8)
Summer Delight		90		91	96	88	93	100	93(6)
Tiffany	102	106	102	93	82	93	102	98	97(8)
VA T1 Brown		89		99	87	91	94	98	93(6)
Velvet		94		100	97	98	95	103	98(6)
Witkope	94	100	93	101	115	103	101	104	101(8)

[1] Establishment year.
[2] Use this summary table as a guide in making variety decisions, but refer to specific tables in this report to determine statistical differences in forage yield between varieties.
[3] Mean only presented when respective variety was included in two or more trials.

11-2013