



2019 Annual Grass Report

Warm Season and Cool Season (Cereals)

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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 2013-2019 forage yield trials with sudangrass, sorghum/sudangrass, millets, teff, and cereal crops.

Sudangrass (*Sorghum bicolor* ssp. *drummondii*) 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 to 12 feet tall and is typically harvested when the seed is in the milk to soft dough stage.

Table 2. Temperature and rainfall at Princeton, Kentucky, in 2017, 2018, and 2019

	2017				2018				2019 ²			
	Temp		Rainfall		Temp		Rainfall		Temp		Rainfall	
	°F	DEP ¹	IN	DEP	°F	DEP	IN	DEP	°F	DEP	IN	DEP
JAN	43	+9	3.18	-0.62	32	-2	4.28	+0.48	36	+2	3.62	-0.18
FEB	49	+11	1.78	-2.65	45	+7	9.5	+5.07	43	+2	11.14	+6.71
MAR	50	+3	4.09	-0.85	47	0	9.53	-1.41	44	-3	3.34	-1.60
APR	63	+4	4.28	-0.52	53	-6	4.9	+0.1	59	0	4.5	-0.30
MAY	67	0	4.43	-0.53	74	+7	4.69	-0.27	69	+2	5.61	+1.05
JUN	74	-1	5.39	+1.54	78	+3	7.8	+3.95	73	+2	4.33	+0.48
JUL	78	0	2.23	-2.06	78	0	2.58	-1.71	77	-1	3.12	-1.17
AUG	75	-2	1.39	-2.62	77	0	2.68	-1.33	76	-1	6.31	+2.30
SEP	71	0	3.93	+0.6	74	+4	5.61	+2.28	75	+4	0.34	-2.99
OCT	61	+2	6.65	+3.6	61	+2	2.96	-0.09	59	0	6.36	+3.31
NOV	50	+2	2.96	-1.67	42	-5	4.77	+0.14				
DEC	37	-2	3.01	-2.03	42	+3	5.45	+0.41				
Total			43.32	-7.81			58.75	+7.62			48.67	+7.21

¹ DEP is departure from the long-term average.

² 2019 data is for ten months through October.

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.

The brown midrib or BMR trait is outward expression of a genetic mutation in forage sorghum, sorghum-sudangrass, sudangrass and pearl millet. In most

cases, plants possessing the BMR trait contain less or altered lignin, making the plant more digestible and increasing animal production. Therefore, it is desirable to seed summer annuals which have the BMR trait in addition to other desirable characteristics like high yield. With BMR varieties, the midrib of the leaf appears brown or tannish in color.

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

Table 1. Temperature and rainfall at Lexington, Kentucky, in 2015, 2016, 2017, 2018, and 2019

	2015				2016				2017				2018				2019 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	32	+1	2.17	-0.69	32	+1	0.80	-2.06	40	+9	6.81	+3.95	31	0	2.01	-0.85	33	+2	4.11	+1.25
FEB	26	-9	3.08	-0.13	38	+3	6.09	+2.88	47	+12	4.46	+1.25	45	+10	9.77	+6.56	42	+7	7.64	+4.43
MAR	45	+1	7.34	+2.94	52	+8	4.07	-0.33	48	+4	3.34	-1.06	42	-2	5.16	+0.76	43	-1	3.44	-0.91
APR	57	+2	13.19	+9.31	57	+2	3.97	+0.09	62	+7	4.17	+0.29	50	-5	5.52	+1.64	54	+4	4.76	+0.88
MAY	69	+5	3.02	-1.45	64	0	9.17	+4.70	66	+2	7.74	+3.27	73	+9	8.39	+3.92	69	+5	4.49	+0.02
JUN	75	+3	8.20	+4.54	76	+4	5.09	+1.43	73	+1	7.68	+4.02	76	+4	6.42	+2.76	73	+1	6.13	+2.47
JUL	77	+1	10.22	+5.22	79	+3	7.43	+2.43	76	0	4.49	-0.51	77	+1	6.15	+1.15	79	+3	3.30	-1.70
AUG	74	-1	3.49	-0.44	79	+4	4.37	+0.44	74	-1	6.66	+2.73	77	+2	6.45	+2.52	77	+2	2.42	-1.51
SEP	72	+4	3.49	+0.29	74	+6	2.18	-1.02	69	+1	4.72	+1.52	74	+6	12.88	+9.68	77	+9	0.18	-3.02
OCT	59	+2	2.78	+0.21	64	+7	0.37	-2.20	60	+3	6.06	+3.49	59	+2	6.54	+3.97	61	+4	8.15	+5.58
NOV	51	+6	3.72	+0.33	51	+6	1.94	-1.45	47	+2	3.09	-0.30	42	-3	5.64	+2.25				
DEC	49	+13	8.42	+4.44	37	+1	9.4	+5.42	35	-1	2.66	-1.32	40	+4	7.35	+3.37				
Total			69.12	+24.57			54.88	+10.33			61.88	+17.33			82.28	+37.73			44.67	+7.49

¹ DEP is departure from the long-term average.

² 2019 data is for ten months through October.

been considerable interest in teff as a forage crop. It is high quality, palatable, and fine-stemmed and therefore makes excellent hay.

Crabgrass (*Digitaria sanguinalis*) is a warm season annual that propagates by seed. It is adapted to many soil types. Crabgrass can be utilized by either grazing or haying and is one of the highest quality warm season forages at a vegetative stage.

Cool season annual grasses (specifically cereal crops) are also used as forage crops for hay, baleage, or grazing. The cereal crops used in this report are wheat (*Triticum aestivum*), rye (*Secale cereale*), oats (*Avena sativa*), and triticale (*Triticum secale*).

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). Forage sorghum, sorghum-sudangrass hybrids, and sudangrass 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 forage sorghum and foxtail millet are harvested only once. For more detailed management recommendations refer to *Warm Season Annual Grasses in Kentucky* (AGR-229) and related publications at <http://forages.ca.uky/species>.

Table 3. 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 Proceedings, 416-418.

Considerations in Selecting a Cool Season Cereal Variety

The major factors in selecting cool season cereal grass varieties are yield, winter survival, and regrowth. If cutting a cereal grass for silage or baleage, yield at the first harvest of the season is most important. For all cereals, winter survival is an important factor. Fortunately

winter wheat and cereal rye rarely show winterkill in Kentucky regardless of the variety. Winter oats are a marginal crop in Kentucky because severe winterkill usually occurs one out of every two to three years. We have started testing spring plant spring oats and other cereals (Tables 35, 36, 37, and 38) to determine which species and which varieties have the best potential as short term cool

season forage crops. Notice the very low yield of winter wheat when planted in the spring. Spring plantings of winter wheat are not recommended because the lack of vernalization temperatures prevent stem elongation and vigorous spring growth.

Description of the Tests

This report summarizes eighteen warm season annual studies (2015-2019) and seven cool-season annual studies (2015-2019) in Lexington. It also summarizes thirteen warm season annual studies (2017-2019) in Princeton. The soils at Lexington (Maury) and Princ-

eton (Crider) are well-drained silt loams and are well suited to annual grass production. Plots were 5 feet by 20 feet in a randomized complete block design with four replications with a harvested area of 5 feet by 15 feet. The wheat trial plots were 4 feet by 15 feet with a harvested area of 4 feet by 12 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), teff (5 for uncoated, 8 for coated), wheat (120), rye (110), oats (80) and triticale (100). Plots were harvested with a sickle-type forage plot harvester. Cutting

height was 4 inches for teff and 6 inches for millet, sudangrass, and sorghum-sudangrass. The cool season grasses were cut at a height of 3 inches. The forage sorghum was harvested by hand (the center 15-foot row). 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. See table footnotes for specific nitrogen application for each trial. Pests were controlled so that they would not limit yield. For example, for weed control in forage

Table 4. Dry matter yields, seedling vigor, percent stand, maturity, and plant height of sudangrass varieties sown May 17, 2017, at Lexington, Kentucky

Variety	Proprietor/ Distributor	Seedling Vigor ¹ Jun 14	Percent Stand		Maturity ²			Plant Height (in)			Yield (DM tons/acre)			
			Jun 14	Oct 13	Jul 12	Aug 15	Oct 13	Jul 12	Aug 15	Oct 13	Jul 12	Aug 15	Oct 13	Total
Commercial Varieties-Available for Farm Use														
AS9302 BMR ³ (Brachytic Dwarf)	Advanta Seeds/Ramer Seed	5.0	100	99	31.5	31.0	56.0	32	28	31	1.47	1.15	1.30	3.92*
FSG1000 BMR	Farm Science Genetics	4.1	99	80	33.3	33.3	47.5	44	44	33	1.17	1.46	0.83	3.46*
ProMax BMR	Ampac Seed	4.3	98	74	38.8	33.5	43.5	48	45	33	1.25	1.34	0.77	3.35*
SS130 BMR	Cal/West Seeds	4.8	100	73	33.3	33.0	47.3	43	41	28	1.40	1.26	0.46	3.12
Piper	Public	4.3	99	98	32.8	33.0	43.5	39	41	29	1.02	1.01	0.53	2.55
HayKing BMR	Cal/West Seeds	4.1	98	31	35.8	33.0	43.5	45	41	31	1.32	0.96	0.24	2.52
Mean		4.4	99	76	34.2	32.8	46.9	42	40	31	1.27	1.20	0.69	3.15
CV,%		12.9	1	25	10.3	.9	6.7	6	6	10	18.72	20.20	27.25	14.63
LSD,0.05		0.9	2	29	5.3	0.4	4.8	4	4	4	0.36	0.36	0.28	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 3 for complete scale.

³ BMR (brown midrib) means that a variety has been developed to produce lower amounts of lignin, which usually translates into higher quality.

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

Nitrogen application: 40 lb/A of actual nitrogen on May 18 and 60 lb/A of actual nitrogen on August 21 (Total of 100 lb of N/acre).

Table 5. Dry matter yields, seedling vigor, stand rating, maturity, and plant height of sudangrass varieties sown May 29, 2018, at Lexington, Kentucky

Variety	Proprietor/ Distributor	Seedling Vigor ¹ Jun 13	Percent Stand Jun 13	Maturity ²				Plant Height (in)				Yield (DM tons/acre)				Total
				Jul 9	Aug 2	Aug 30	Oct 12	Jul 9	Aug 2	Aug 30	Oct 12	Jul 9	Aug 2	Aug 30	Oct 12	
Commercial Varieties-Available for Farm Use																
HayKing BMR ³	Cal/West Seeds	4.6	99	34.0	32.5	37.5	45.0	66	53	46	47	2.38	2.11	1.31	1.37	7.16*
AS9302 BMR (Brachytic Dwarf)	Advanta Seed / Ramer Seed	4.8	98	33.3	31.0	32.3	50.8	56	35	36	35	2.85	1.55	1.22	1.19	6.81*
ProMax BMR	Ampac Seed	3.8	93	34.0	32.8	45.0	45.0	69	56	49	41	2.16	2.09	1.35	1.06	6.66
Piper	Public	5.0	100	33.5	32.3	32.3	35.8	60	50	41	32	2.07	1.94	0.94	0.67	5.62
Mean		4.5	97	33.7	32.1	36.8	44.1	63	48	43	38	2.36	1.92	1.20	1.07	6.56
CV,%		7.9	2	1.0	1.2	15.3	7.6	3	5	5	10	5.73	7.60	16.30	15.83	4.26
LSD,0.05		0.6	4	0.5	0.6	9.0	5.4	3	4	3	6	0	0.23	0.31	0.27	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 3 for complete scale.

³ BMR (brown midrib) means that a variety has been developed to produce lower amounts of lignin, which usually translates into higher quality.

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

Nitrogen application: 60 lb/A of actual nitrogen on June 1 and July 19 (Total of 120 lb of N/acre) (Total of 150 lb of N/acre).

sorghum the herbicides atrazine and Dual were used, but using Dual requires that the seed first be treated with Concep to prevent seedling injury.

Results and Discussion

Weather data for Lexington and Princeton are presented in Tables 1 and 2. Yield data (on a dry-matter basis) for all tests are reported in Tables 4 through 41. 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), 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 42 through 48 are summaries of yield data from 2008 to 2019 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 42 through 48, 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 in comparison to varieties that have only been tested at one location or for one year.

Summary

Warm and cool season 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 annual grass management. They are available from your county Extension office or on the UK Forage website at forages.ca.uky.edu.

- Lime and Fertilizer Recommendations (AGR-1)
- Grain and Forage Crop Guide for Kentucky (AGR-18)
- Establishing Forage Crops (AGR-64)
- Warm Season Annual Grasses in Kentucky. (AGR-229)
- Sudangrass and Sorghum-sudangrass Hybrids (AGR-234)
- Pearl Millet (AGR-231)
- Forage Sorghum (AGR-230)
- Crabgrass (AGR-232)
- Extending Grazing and Reducing Stored Feed Needs (AGR-199)
- Managing Small Grains for Livestock Forage (AGR-160)

About the Authors

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Table 6. Dry matter yields, seedling vigor, stand rating, maturity, and plant height of sudangrass varieties sown May 16, 2019, at Lexington, Kentucky

Variety	Proprietors/ Distributors	Seedling Vigor ¹ Jun 3	Percent Stand Jun 3	Maturity ²				Plant Height (in)				Yield (DM tons/acre)					
				Jun 26	Jul 11	Aug 1	Sep 9	Jun 26	Jul 11	Aug 1	Sep 9	Jun 26	Jul 11	Aug 1	Sep 9	Oct 15	Total
Commercial Varieties-Available for Farm Use																	
Trudan Headless	S & W Seed Company	4.0	92	35.3	33.8	36.0	44.3	31	30	31	41	0.96	1.08	1.24	1.75	0.74	5.77*
AS9302 BMR ³ (BrachyticDwarf)	Advanta Seed/ Ramer Seed	4.3	96	33.0	27.0	35.3	45.8	31	31	31	61	1.00	0.80	1.33	1.51	0.61	5.25*
ProMax BMR	Cisco Seeds	4.5	85	40.5	43.5	39.0	47.3	31	32	32	51	0.77	1.27	1.10	1.42	0.68	5.24*
SS130 BMR	Cal/West Seeds	4.3	90	39.0	39.0	36.8	36.8	31	31	31	42	0.89	1.12	1.05	1.11	0.64	4.81
Piper	Public	4.9	96	45.8	41.3	39.8	41.3	31	31	32	44	1.01	1.20	0.98	0.92	0.68	4.79
Mean		4.4	92	38.7	36.9	37.4	43.1	31	31	31	47	0.92	1.10	1.14	1.34	0.67	5.17
CV,%		10.5	2	8.6	4.6	7.8	6.6	0	3	1	7	15.27	9.28	11.34	6.64	25.74	7.17
LSD,0.05		0.7	2	5.1	2.6	4.5	4.4	0	1	1	5	0.22	0.16	0.20	0.14	0.27	0.57

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

² Maturity rating scale: 37 = flag leaf emergence, 45 = boot swollen, 50 = beginning of inflorescence emergence, 58 = complete emergence of inflorescence, 62 = beginning of pollen shed. See Table 3 for complete scale.

³ BMR (brown midrib) means that a variety has been developed to produce lower amounts of lignin, which usually translates into higher quality.

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

Nitrogen application: 60 lb/A of actual nitrogen on May 15, 30 lb/A on June 28 and 60 lb/A on Aug 6 (Total of 150 lb of N/acre).

Table 7. Dry matter yields, seedling vigor, percent stand, maturity, and plant height of sudangrass varieties sown May 23, 2017, at Princeton, Kentucky

Variety	Proprietor/ Distributor	Seedling Vigor ¹ Jun 12	Percent Stand		Maturity ²			Plant Height (in)			Yield (DM tons/acre)				
			Jun 12	Oct 25	Jul 11	Aug 14	Sep 21	Jul 11	Aug 14	Sep 21	Jul 11	Aug 14	Sep 21	Oct 25	Total
Commercial Varieties-Available for Farm Use															
AS9302 BMR ³ (Brachytic Dwarf)	Advanta Seeds/Ramer Seed	4.5	100	98	32.5	31.8	46.3	54	47	36	3.09	1.64	1.20	1.02	6.95*
HayKing BMR	Cal/West Seeds	4.4	99	97	33.8	39.0	46.3	62	55	45	2.43	1.29	1.08	0.97	5.77*
ProMax BMR	Ampac Seed	3.8	95	93	35.0	45.0	45.0	68	62	47	2.51	1.21	1.04	0.81	5.56*
Piper	Public	4.5	100	95	33.8	35.3	45.0	62	47	38	2.48	0.97	0.83	0.73	5.01
Mean		4.3	98	96	33.8	37.8	45.6	61	53	41	2.63	1.28	1.04	0.88	5.82
CV,%		7.3	2	3	4.2	13.8	4.1	6	5	6	7.89	18.97	18.13	17.93	7.08
LSD,0.05		0.5	3	5	2.3	8.3	3.0	6	4	4	0.33	0.39	0.30	0.25	0.66

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 3 for complete scale.

³ BMR (brown midrib) means that a variety has been developed to produce lower amounts of lignin, which usually translates into higher quality.

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

Nitrogen application: 75 lb/A of actual nitrogen on May 30.

Table 8. Dry matter yields, stand rating, maturity, and plant height of sudangrass varieties sown May 29, 2019, at Princeton, Kentucky

Variety	Proprietor/ Distributor	Percent Stand Jun 27	Maturity ¹ Jun 27	Plant Height (in)			Yield (DM tons/acre)				
				Jun 27	Jul 25	Aug 29	Jul 1	Jul 26	Aug 29	Nov 4	Total
Commercial Varieties-Available for Farm Use											
AS9302 BMR ² (Brachytic Dwarf)	Advanta Seed/ Ramer Seed	93	34.0	33	41	49	1.81	3.00	1.23	1.42	7.46*
Trudan Headless	S & W Seed Company	94	34.0	35	48	53	1.88	2.47	1.45	1.57	7.37*
SS130 BMR	Cal/West Seeds	95	35.5	40	55	50	1.73	2.50	1.09	1.00	6.32*
Piper	Public	96	34.8	40	54	52	1.66	2.50	0.98	0.55	5.69
ProMax BMR	Cisco Seeds	94	34.5	39	56	57	1.58	2.42	0.94	0.74	5.68
Mean		94	34.6	37	51	52	1.73	2.58	1.14	1.06	6.50
CV,%		3	3.0	5	6	6	12.65	20.88	10.68	31.43	13.03
LSD,0.05		4	1.6	3	5	5	0.34	0.83	0.19	0.51	1.31

¹ Maturity rating scale: 37 = flag leaf emergence, 45 = boot swollen, 50 = beginning of inflorescence emergence, 58 = complete emergence of inflorescence, 62 = beginning of pollen shed. See Table 3 for complete scale.

² BMR (brown midrib) means that a variety has been developed to produce lower amounts of lignin, which usually translates into higher quality.

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

Nitrogen application: 60 lb/A of actual nitrogen on May 22 and 60 lb/A of actual nitrogen on July 10 and July 29 (Total of 180 lb of N/acre).

Table 9. Dry matter yields, seedling vigor, percent stand, maturity, and stand height of sorghum-sudangrass varieties sown May 17, 2017, at Lexington, Kentucky

Variety	Proprietor/ Distributor	Seedling Vigor ¹ Jun 14	Percent Stand		Maturity ²			Plant Height (in)			Yield (DM tons/acre)			Total
			Jun 14	Oct 13	Jul 3	Aug 3	Sep 25	Jul 3	Aug 3	Sep 25	Jul 3	Aug 3	Sep 25	
Commercial Varieties-Available for Farm Use														
HyGain	Turner Seed	4.9	100	100	31.8	40.8	46.3	44	47	50	1.74	2.09	1.74	5.56*
SS211	Southern States	4.3	99	98	31.3	34.5	45.0	44	43	41	1.71	2.05	1.55	5.32*
KFSugar-Pro55S	Byron Seed	4.5	99	98	31.0	40.0	50.8	39	40	39	1.77	1.73	1.32	4.83
GreenGrazer V	Farm Science Genetics	5.0	100	100	31.3	40.0	45.0	42	42	41	1.70	1.60	1.51	4.81
Sweet-For-Ever BMR ³	Gayland Ward Seed	4.6	99	88	30.5	40.5	46.3	41	39	38	1.64	1.71	1.32	4.67
AS6504 BMR6 (Dry Stalk)	Advanta Seeds/Ramer Seed	4.6	99	91	30.0	34.0	37.0	35	41	38	1.26	1.82	1.55	4.63
GW 300 BMR	Gayland Ward Seed	3.9	97	96	30.5	35.8	50.3	40	41	47	1.34	1.43	1.63	4.40
NutraKing BMR	Public	4.0	98	93	30.0	34.8	47.3	38	36	35	1.54	1.48	1.19	4.21
SuperSugar (Delayed Maturity)	Gayland Ward Seed	4.0	100	100	29.0	33.8	39.0	32	36	36	1.08	1.49	1.33	3.90
Surpass BMR	Turner Seed	4.8	100	98	29.0	35.0	45.0	32	31	29	1.15	1.24	1.31	3.70
AS6402 BMR (Brachytic Dwarf)	Advanta Seeds/Ramer Seed	3.8	97	97	29.0	31.5	37.8	29	33	27	0.94	1.41	1.16	3.50
SweetSix BMR (Dry Stalk)	Gayland Ward Seed	3.6	98	43	29.5	31.8	41.0	31	36	26	1.19	1.33	0.62	3.14
Experimental Varieties														
X50643	Scott Seed	5.0	100	95	30.0	31.3	40.5	36	33	41	1.78	1.55	2.24	5.57*
X54243	Scott Seed	4.9	100	100	30.0	31.5	39.0	38	34	41	1.60	1.49	2.34	5.43*
X5062	Scott Seed	5.0	100	99	31.3	34.8	47.5	41	41	45	1.91	1.82	1.62	5.35*
X50644	Scott Seed	4.5	100	100	29.0	32.3	37.3	29	38	33	1.42	2.04	1.54	5.00*
X51214	Scott Seed	3.5	98	98	31.0	37.8	45.0	41	47	44	1.29	1.83	1.43	4.55
X50651	Scott Seed	4.5	100	97	29.0	33.3	50.8	29	34	37	1.27	1.61	1.65	4.53
X50652	Scott Seed	4.3	100	100	29.0	31.3	37.3	25	32	31	0.91	1.74	1.51	4.16
X5129	Scott Seed	4.4	100	96	29.5	38.0	40.5	34	36	40	1.34	1.38	1.44	4.16
Mean		4.4	99	94	30.1	35.1	43.4	36	38	38	1.43	1.64	1.50	4.57
CV,%		12.6	1	7	2.3	12.9	9.5	10	9	16	19.71	14.96	18.14	11.09
LSD,0.05		0.8	2	9	1.0	6.4	5.9	5	5	9	0.40	0.35	0.39	0.72

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 3 for complete scale.

³ BMR (brown midrib) means that a variety has been developed to produce lower amounts of lignin, which usually translates into higher quality.

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

Nitrogen application: 40 lb/A of actual nitrogen on May 18 and 60 lb/A of actual nitrogen on July 3 (Total of 100 lb of N/acre).

Table 10. Dry matter yields, seedling vigor, stand rating, maturity, and plant height of sorghum-sudangrass varieties sown May 29, 2018, at Lexington, Kentucky

Variety	Proprietor/ Distributor	Seedling Vigor ¹ Jun 13	Percent Stand		Maturity ²			Plant Height (in)				Yield (DM tons/acre)				Total	
			Jun 13	Oct 12	Jul 9	Aug 2	Aug 30	Oct 12	Jul 9	Aug 2	Aug 30	Oct 12	Jul 9	Aug 2	Aug 30		Oct 12
Commercial Varieties-Available for Farm Use																	
SS211	Southern States	3.5	86	86	32.8	15.8	32.5	42.0	72	44	44	42	2.13	2.28	1.69	1.44	7.54*
Hygain	Turner Seed	3.6	97	97	33.0	15.8	33.0	41.8	68	44	43	37	2.23	2.23	1.62	1.36	7.45*
NutraKing BMR ³	Public	4.6	99	99	32.8	15.0	32.0	45.0	63	38	38	31	2.60	2.01	1.58	1.05	7.24*
SweetSix BMR (Dry Stalk)	Gayland Ward Seed	5.0	100	100	33.0	14.5	35.3	47.5	62	34	38	32	2.47	2.00	1.46	0.92	6.85*
SuperSugar (Delayed Maturity)	Gayland Ward Seed	4.4	100	100	32.8	15.0	32.3	33.0	68	38	41	38	2.26	1.71	1.43	1.24	6.64
AS6504 BMR (Dry Stalk)	Advanta Seed/ Ramer Seed	4.3	98	95	31.8	15.0	32.0	35.0	58	35	39	29	2.59	1.64	1.58	0.74	6.55
GW300 BMR	Gayland Ward Seed	3.4	96	96	32.8	14.8	32.8	45.0	74	37	43	40	2.36	1.50	1.41	0.96	6.24
SweetForEver BMR	Gayland Ward Seed	4.6	98	60	31.8	14.5	32.0	35.0	63	35	39	29	2.45	1.34	1.02	0.49	5.31
AS6402 BMR (Brachytic Dwarf)	Advanta Seed/ Ramer Seed	4.4	96	96	32.0	14.8	32.0	45.0	53	32	36	26	1.93	1.26	1.33	0.70	5.21
Surpass BMR	Turner Seed	4.4	89	89	31.0	14.0	36.5	44.0	53	31	38	26	1.79	1.22	1.15	0.65	4.82
Mean		4.2	96	92	32.4	14.9	33.0	41.3	63	37	40	33	2.28	1.72	1.43	0.96	6.39
CV,%		12.3	8	11	1.7	5.2	10.3	12.7	6	6	7	13	9.80	10.16	14.61	22.12	8.41
LSD,0.05		0.8	11	15	0.8	1.1	4.9	7.6	6	3	4	6	0.32	0.25	0.30	0.31	0.78

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 3 for complete scale.

³ BMR (brown midrib) means that a variety has been developed to produce lower amounts of lignin, which usually translates into higher quality.

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

Nitrogen application: 60 lb/A of actual nitrogen on June 1 and July 19 (Total of 120 lb of N/acre).

Table 11. Dry matter yields, seedling vigor, stand rating, maturity, and plant height of sorghum-sudangrass varieties sown May 17, 2019, at Lexington, Kentucky

Variety	Proprietor/ Distributor	Seedling Vigor ¹ Jun 3	Percent Stand Jun 3	Maturity ²				Plant Height (in)				Yield (DM tons/acre)					
				Jun 26	Jul 16	Aug 5	Sep 9	Jun 26	Jul 16	Aug 5	Sep 9	Jun 26	Jul 16	Aug 5	Sep 9	Oct 15	Total
Commercial Varieties-Available for Farm Use																	
HyGain	Turner Seed	4.4	97	47.3	35.3	38.3	50.3	28	31	32	53	1.77	1.10	1.26	2.08	0.65	6.87*
Super Sweet10	Dyna-Gro Seeds	4.3	100	42.8	32.3	36.8	46.5	27	31	32	53	1.79	1.04	1.30	2.06	0.68	6.87*
NutraKing BMR ³	Public	4.8	100	43.5	29.3	34.5	44.3	27	28	32	52	1.98	0.96	1.32	1.82	0.61	6.67*
Danny Boy II BMR	Dyna-Gro Seeds	3.5	98	36.0	30.0	33.0	43.5	27	29	32	35	1.38	1.17	1.24	2.14	0.72	6.65*
SugarGraze II	Coffey Seed	4.6	98	43.5	36.0	38.3	48.0	28	31	32	52	1.64	1.14	1.14	1.76	0.57	6.25*
Fullgraze II	Dyna-Gro Seeds	3.9	99	42.8	30.0	37.5	39.0	27	29	31	35	1.62	0.59	1.41	1.59	0.48	5.69
Fullgraze II BMR	Dyna-Gro Seeds	4.4	99	39.0	27.8	33.0	37.5	27	29	32	32	1.37	0.79	1.07	1.74	0.53	5.49
F75FS13	Dyna-Gro Seeds	4.1	98	36.0	30.0	33.0	39.0	27	30	35	55	1.47	0.81	1.15	1.43	0.44	5.31
AS6401 BMR	Advanta Seed/Ramer Seed	3.5	97	33.8	28.5	32.3	39.0	27	28	32	43	0.91	0.78	0.90	1.67	0.49	4.76
Xtragraze BMR	Coffey Seed	4.5	95	36.8	28.5	35.3	41.3	27	30	32	48	1.12	0.63	0.96	1.11	0.66	4.48
Surpass BMR	Turner Seed	3.8	93	30.0	30.8	27.8	36.8	27	34	33	54	0.86	0.85	0.79	1.27	0.49	4.26
AS6402 BMR (Brachytic Dwarf)	Advanta Seed	4.0	98	30.0	30.8	24.0	34.5	27	31	30	52	0.71	0.95	0.61	1.06	0.46	3.79
Experimental Varieties																	
18552	Gayland Ward Seed	4.8	100	53.3	34.5	37.5	55.5	28	30	32	51	1.98	1.10	1.28	2.10	0.77	7.24*
18182 BMR	Gayland Ward Seed	4.8	99	45.8	31.5	35.3	50.3	28	29	32	53	1.89	0.86	1.30	1.97	0.52	6.53*
ADVXS007 BMR	Advanta Seed/Ramer Seed	3.1	96	34.5	30.8	31.5	38.3	27	30	32	45	1.30	1.19	1.09	2.05	0.69	6.31*
19154	Gayland Ward Seed	3.6	98	41.3	32.3	34.5	51.8	27	31	32	32	1.42	0.86	0.97	1.77	0.63	5.65
19102	Gayland Ward Seed	4.4	99	36.8	33.0	30.8	44.3	27	29	31	32	1.44	1.03	0.79	1.79	0.56	5.62
18180	Gayland Ward Seed	4.6	100	39.0	30.8	33.8	42.0	27	29	32	35	1.29	0.87	0.97	1.62	0.54	5.30
19153	Gayland Ward Seed	4.1	100	36.8	33.0	31.5	47.3	27	29	32	34	1.26	0.89	0.87	1.59	0.51	5.14
18181 BMR	Gayland Ward Seed	3.8	97	37.5	28.5	36.0	34.5	27	29	32	32	1.35	0.70	1.10	1.26	0.47	4.89
ADVXS8007 BMR	Advanta Seed/Ramer Seed	4.1	99	33.0	30.0	28.5	39.8	27	30	32	52	1.06	1.04	0.81	1.38	0.49	4.77
ADVXS008 BMR	Advanta Seed/Ramer Seed	3.0	98	28.5	29.3	25.5	33.0	26	30	32	38	0.92	0.99	0.66	1.30	0.60	4.47
3618 BMR	Coffey Seed	3.3	92	27.8	31.5	21.0	33.0	26	28	31	50	0.85	0.93	0.67	1.17	0.36	3.99
5618 BMR	Coffey Seed	3.4	93	27.0	32.3	18.0	33.0	26	31	31	56	0.63	1.07	0.36	1.26	0.49	3.81
3619 BMR	Coffey Seed	2.8	73	28.5	29.3	24.8	35.3	27	49	41	58	0.66	0.69	0.59	1.04	0.49	3.47
5619 BMR	Coffey Seed	2.6	59	25.5	34.5	28.5	42.8	26	50	36	58	0.31	0.93	0.37	0.96	0.39	2.96
Mean		3.9	95	36.8	31.2	31.6	41.5	27	31	32	46	1.27	0.92	0.96	1.58	0.55	5.28
CV,%		15.0	11	13.1	11.3	12.9	13.2	2	9	10	12	33.66	28.75	36.37	20.52	29.52	17.64
LSD,0.05		0.8	14	6.8	5.0	8.0	7.2	1	4	5	8	0.60	0.37	0.49	0.46	0.23	1.31

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 3 for complete scale.

³ BMR (brown midrib) means that a variety has been developed to produce lower amounts of lignin, which usually translates into higher quality.

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

Nitrogen application: 60 lb/A of actual nitrogen on May 15, 30 lb/A on June 28 and 60 lb/A on Aug 6 (Total of 150 lb of N/acre).

Table 12. Dry matter yields, seedling vigor, percent stand, maturity, and stand height of sorghum-sudangrass varieties sown May 23, 2017, at Princeton, Kentucky

Variety	Proprietor/ Distributor	Seedling Vigor ¹ Jun 12	Percent Stand		Maturity ²			Plant Height (in)			Yield (DM tons/acre)				
			Jun 12	Oct 25	Jul 11	Aug 14	Sep 21	Jul 11	Aug 14	Sep 21	Jul 11	Aug 14	Sep 21	Oct 25	Total
Commercial Varieties-Available for Farm Use															
HyGain	Turner Seed	4.8	98	100	34.5	33.0	45.0	69	59	41	2.92	1.83	1.36	1.01	7.11*
AS6504 BMR ³ (Dry Stalk)	Advanta Seed/Ramer Seed	4.4	95	89	32.0	31.8	39.0	60	49	36	2.92	1.66	1.14	0.52	6.23
SS211	Southern States	4.6	94	83	34.0	32.3	43.5	71	54	41	2.58	1.52	1.21	0.63	5.94
FSG214 BMR	Farm Science Genetics	5.0	98	95	36.5	35.5	45.0	70	54	39	2.71	1.59	0.93	0.70	5.94
NutraKing BMR	Public	4.9	98	98	33.8	33.8	45.0	65	51	35	2.88	1.71	0.83	0.52	5.93
SweetSix BMR (Dry Stalk)	Gayland Ward	4.8	98	94	36.5	32.0	43.5	65	50	34	2.72	1.36	0.89	0.65	5.62
AS6402 BMR (Brachytic Dwarf)	Advanta Seed/Ramer Seed	4.9	95	94	31.5	31.8	39.0	53	44	32	2.47	1.34	0.92	0.64	5.37
SuperSugar (Delayed Maturity)	Gayland Ward	4.6	99	99	32.8	32.0	40.5	67	49	37	2.24	1.21	1.05	0.71	5.21
SuperSugar	Gayland Ward	4.1	96	96	36.0	38.8	45.0	65	56	40	2.10	1.02	1.07	0.80	4.99
Surpass BMR	Turner Seed	4.6	96	96	31.8	30.8	42.0	51	36	32	2.26	0.86	0.87	0.85	4.84
GW300 BMR	Gayland Ward	3.9	96	94	33.3	32.3	45.0	68	53	40	1.96	1.00	0.73	0.60	4.30
Sweet-For-Ever-BMR	Gayland Ward	4.4	96	25	32.8	31.0	35.0	67	41	28	2.70	0.96	0.38	0.16	4.20
Experimental Varieties															
X54243	Scott Seed	4.6	100	100	33.3	31.0	45.0	63	38	45	2.96	1.25	1.81	1.18	7.20*
X51214	Scott Seed	4.3	98	98	33.8	32.8	43.5	68	60	38	2.62	1.74	1.12	1.19	6.67*
X50643	Scott Seed	4.9	99	100	32.8	31.0	39.0	61	39	41	3.11	1.16	1.36	0.98	6.61*
X5062	Scott Seed	4.9	99	99	33.8	32.0	43.5	64	50	38	2.74	1.45	1.06	0.60	5.85
X50652	Scott Seed	4.9	99	99	31.5	30.5	37.3	47	35	32	2.75	0.91	1.27	0.86	5.78
X50651	Scott Seed	4.3	96	98	32.3	31.0	45.0	50	38	29	2.63	1.05	1.07	0.75	5.51
X5129	Scott Seed	4.4	98	96	32.3	31.8	40.5	62	44	34	2.52	1.14	0.97	0.79	5.42
X50644	Scott Seed	4.8	97	97	31.5	30.5	39.0	50	36	35	2.58	0.96	1.21	0.54	5.30
Mean		4.6	97	92	33.3	32.3	42.0	62	47	36	2.62	1.29	1.06	0.73	5.70
CV,%		8.4	2	7	7.2	7.6	5.4	5	10	8	10.94	16.92	24.25	34.29	10.16
LSD,0.05		0.5	3	9	3.4	3.5	3.2	4	7	4	0.41	0.31	0.36	0.36	0.82

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 3 for complete scale.

³ BMR (brown midrib) means that a variety has been developed to produce lower amounts of lignin, which usually translates into higher quality.

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

Nitrogen application: 75 lb/A of actual nitrogen on May 30

Table 13. Dry matter yields and plant height of sorghum-sudangrass and sudangrass varieties sown June 8, 2018, at Princeton, Kentucky

Variety	Species	Proprietor/ Distributor	Plant Height (in)		Yield (DM tons/acre)		
			Jul 25	Sep 4	Jul 25	Sep 4	Total
Commercial Varieties-Available for Farm Use							
NutraKing BMR ¹	sorghum-sudangrass	Public	54	60	1.81	1.14	2.96*
AS6504 BMR (Dry Stalk)	sorghum-sudangrass	Advanta Seed/Ramer Seed	44	59	1.65	1.27	2.91*
FSG214 BMR	sorghum-sudangrass	Farm Science Genetics	54	68	1.60	1.27	2.87*
HyGain	sorghum-sudangrass	Turner Seed	53	65	1.42	1.38	2.80*
Sweet Six BMR (Dry Stalk)	sorghum-sudangrass	Gayland Ward Seed	52	63	1.67	1.13	2.80*
AS6402 BMR (Brachytic Dwarf)	sorghum-sudangrass	Advanta Seed/Ramer Seed	44	50	1.44	1.12	2.55*
Surpass BMR	sorghum-sudangrass	Turner Seed	46	53	1.65	0.87	2.52*
AS9302 BMR (Brachytic Dwarf)	sudangrass	Advanta Seed/Ramer Seed	45	57	1.22	1.22	2.44
SS211	sorghum-sudangrass	Southern States	56	73	1.22	1.05	2.27
Super Sugar (Delayed Maturity)	sorghum-sudangrass	Gayland Ward Seed	48	67	1.21	0.94	2.15
Sweet Forever BMR	sorghum-sudangrass	Gayland Ward Seed	55	61	1.32	0.81	2.13
Piper	sudangrass	Public	54	80	0.98	1.09	2.06
Promax BMR	sudangrass	Ampac Seed	53	74	0.76	1.00	1.76
Mean			51	64	1.38	1.10	2.48
CV,%			6	5	14.76	23.06	13.54
LSD,0.05			4	4	0.29	0.36	0.48

¹ BMR (brown midrib) means that a variety has been developed to produce lower amounts of lignin, which usually translates into higher quality.

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

Nitrogen application: 60 lb/A of actual nitrogen on June 8 and July 26 (Total of 120 lb of N/acre).

Table 14. Dry matter yields, stand rating, maturity, and plant height of sorghum-sudangrass varieties sown May 29, 2019, at Princeton, Kentucky

Variety	Proprietor/ Distributor	Percent Stand Jun 20	Maturity ¹ Jul 26	Plant Height (in)			Yield (DM tons/acre)				
				Jul 1	Jul 26	Aug 29	Jul 1	Jul 26	Aug 29	Nov 5	Total
Commercial Varieties-Available for Farm Use											
HyGain	Turner Seed	84	34.5	32	54	65	1.36	2.82	3.25	2.70	10.13*
Super Sweet10	Dyna-Gro Seed	95	33.8	30	43	61	1.72	1.95	3.14	3.06	9.86*
AS6401 BMR ²	Advanta Seed/Ramer Seed	88	33.5	29	43	59	1.48	2.68	3.37	1.80	9.34*
Danny Boy I I BMR	Dyna-Gro Seed	90	34.3	28	39	52	1.40	2.43	3.40	1.96	9.20*
SugarGraze II	Coffey Seed	88	33.8	30	51	62	1.39	1.97	3.37	2.44	9.17*
Fullgraze II	Dyna-Gro Seed	91	33.8	29	45	60	1.36	2.20	3.93	1.56	9.06*
Fullgraze II BMR	Dyna-Gro Seed	91	33.8	28	38	55	1.56	2.13	3.68	1.52	8.90
NutraKing BMR	Public	92	33.0	31	44	54	1.88	2.58	2.80	1.51	8.78
AS6402 BMR (Brachytic Dwarf)	Advanta Seed/Ramer Seed	83	33.5	25	35	45	1.31	2.06	2.59	1.65	7.61
F75FS13	Dyna-Gro Seed	89	33.8	28	37	52	1.36	1.31	2.68	1.00	6.34
Surpass BMR	Turner Seed	86	33.8	23	36	44	1.25	1.70	2.12	1.11	6.19
Xtragraze BMR	Coffey Seed	85	33.8	27	34	54	1.38	1.18	1.95	1.36	5.88
Experimental Varieties											
18552	Gayland Ward Seed	94	34.3	37	49	63	1.88	2.07	3.15	3.14	10.24*
18180	Gayland Ward Seed	88	34.0	30	41	60	1.74	1.95	3.85	2.04	9.59*
19153	Gayland Ward Seed	94	34.0	30	41	57	1.80	2.18	3.54	1.53	9.06*
ADVXS007 BMR	Advanta Seed/Ramer Seed	85	33.8	24	44	57	1.36	2.37	3.26	1.66	8.65
19154	Gayland Ward Seed	85	34.0	29	47	62	1.47	1.81	3.26	1.70	8.25
ADVXS008 BMR	Advanta Seed/Ramer Seed	90	34.0	22	36	46	1.40	2.05	3.00	1.68	8.13
ADVXS8007 BMR	Advanta Seed/Ramer Seed	91	34.0	28	39	54	1.53	1.72	2.90	1.93	8.07
19102	Gayland Ward Seed	94	33.5	27	40	53	1.63	1.75	3.16	1.39	7.93
18182 BMR	Gayland Ward Seed	93	33.8	32	43	58	1.76	1.42	2.56	1.97	7.71
18181 BMR	Gayland Ward Seed	90	33.8	29	34	58	1.67	1.48	3.00	0.81	6.96
5619BMR	Coffey Seed	84	38.0	23	32	40	1.42	1.48	1.69	1.34	5.93
5618 BMR	Coffey Seed	84	33.3	24	33	40	1.19	1.93	1.45	0.91	5.48
3619 BMR	Coffey Seed	85	39.3	23	32	36	1.00	1.66	1.62	1.05	5.33
3618 BMR	Coffey Seed	84	33.0	21	34	36	1.01	1.56	1.42	0.68	4.67
Mean		88	34.1	28	40	53	1.47	1.94	2.85	1.67	7.94
CV,%		4	5.5	9	12	7	17.82	23.91	16.29	36.69	11.69
LSD,0.05		5	2.7	3	7	5	0.37	0.65	0.65	0.87	1.31

¹ Maturity rating scale: 37 = flag leaf emergence, 45 = boot swollen, 50 = beginning of inflorescence emergence, 58 = complete emergence of inflorescence, 62 = beginning of pollen shed. See Table 3 for complete scale.

² BMR (brown midrib) means that a variety has been developed to produce lower amounts of lignin, which usually translates into higher quality.

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

Nitrogen application: 60 lb/A of actual nitrogen on May 22 and 60 lb/A of actual nitrogen on July 10 and July 29 (Total of 180 lb of N/acre).

Table 15. Dry matter yields, stand rating, seedling vigor, maturity, and plant height of pearl millet varieties sown May 17, 2017, at Lexington, Kentucky

Variety	Proprietor/ Distributor	Seedling Vigor ¹ Jun 14	Percent Stand		Maturity ²		Plant Height (in)		Yield (DM tons/acre)		
			Jun 14	Oct 27	Jul 19	Sep 11	Jul 19	Sep 11	Jul 19	Sep 11	Total
Commercial Varieties-Available for Farm Use											
Leafy22 Hybrid	Turner Seed	5.0	100	85	30.3	72.8	32	33	1.35	2.47	3.81*
Tifleaf III Hybrid	Gayland Ward Seed	4.3	99	76	30.8	75.0	34	35	1.28	2.40	3.68*
FSG 300 Hybrid	Farm Science Genetics	3.4	98	78	31.3	70.0	36	41	1.22	2.13	3.35*
SS635	Southern States	4.1	100	76	30.5	72.8	32	35	0.97	1.91	2.89
SS501	Southern States	4.3	100	70	38.8	66.0	45	29	1.15	1.74	2.89
PP102M Hybrid	Cisco Seeds	3.8	99	43	58.5	72.3	51	27	1.37	1.39	2.76
Pennleaf Hybrid	Pennington Seed	3.3	97	51	29.0	75.0	26	29	0.83	1.84	2.67
FSG 315 BMR ³ (Dwarf)	Farm Science Genetics	3.9	98	95	29.0	70.5	27	29	0.87	1.63	2.50
Mean		4.0	99	72	34.8	71.8	35	62	1.13	1.94	3.07
CV,%		12.8	1	22	8.3	5.1	11	11	19.99	16.32	14.79
LSD,0.05		0.8	2	24	4.2	5.4	6	5	0.33	0.46	0.67

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 3 for complete scale.

³ BMR (brown midrib) means that a variety has been developed to produce lower amounts of lignin, which usually translates into higher quality.

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

Nitrogen application: 40 lb/A of actual nitrogen on May 18 and 60 lb/A of actual nitrogen on August 21 (Total of 100 lb of N/acre).

Table 16. Dry matter yields, seedling vigor, stand rating, maturity, and plant height of pearl millet varieties sown May 29, 2018, at Lexington, Kentucky

Variety	Proprietor/ Distributor	Seedling Vigor ¹ Jun 13	Percent Stand Jun 13	Maturity ²				Plant Height (in)				Yield (DM tons/acre)				Total
				Jul 13	Aug 9	Sep 12	Oct 12	Jul 13	Aug 9	Sep 12	Oct 12	Jul 13	Aug 9	Sep 12	Oct 12	
Commercial Varieties-Available for Farm Use																
Tifleaf III Hybrid	Gayland Ward Seed	4.9	98	18.3	52.0	50.0	58.0	38	43	30	24	1.93	3.12	1.09	1.27	7.41*
SS635	Southern States	4.5	99	17.5	48.8	48.0	56.0	38	41	29	23	1.88	2.70	1.28	1.33	7.18*
Leafy22 Hybrid	Turner Seed	5.0	100	18.5	46.3	50.5	57.0	38	43	32	25	1.80	2.72	1.26	1.27	7.06*
Pennleaf Hybrid	Pennington Seed	3.8	95	17.3	48.5	50.5	56.0	35	41	32	25	1.73	2.56	1.10	1.00	6.39
SS501	Southern States	4.1	91	35.5	42.0	54.5	56.0	56	41	42	26	2.05	1.88	1.27	0.90	6.11
PP102M Hybrid	Cisco Seeds	3.6	94	38.3	54.5	57.0	57.5	51	35	36	22	1.95	1.90	1.25	0.83	5.91
SweetSummer	Cisco Seeds	3.9	92	17.0	39.0	53.5	55.5	33	31	26	20	1.60	2.24	0.95	0.85	5.64
Mean		4.3	96	23.2	47.2	52.0	56.6	41	39	32	23	1.85	2.44	1.17	1.06	6.53
CV,%		8.4	3	26.0	5.0	9.5	3.4	3	7	10	10	5.96	8.13	15.13	11.69	5.65
LSD,0.05		0.5	5	8.9	3.5	7.4	2.9	2	4	5	4	0.16	0.30	0.26	0.18	0.55

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 3 for complete scale.

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

Nitrogen application: 60 lb/A of actual nitrogen on June 1 and July 19 (Total of 120 lb of N/acre).

Table 17. Dry matter yields, seedling vigor, stand rating, maturity, and plant height of pearl millet varieties sown May 16, 2019, at Lexington, Kentucky

Variety	Proprietor/ Distributor	Seedling Vigor ¹ Jun 3	Percent Stand Jun 3	Maturity ²				Plant Height (in)				Yield (DM tons/acre)				Total	
				Jul 3	Jul 16	Aug 14	Sep 20	Jul 3	Jul 16	Aug 14	Sep 20	Jul 3	Jul 16	Aug 14	Sep 20		Oct 14
Commercial Varieties-Available for Farm Use																	
Tifleaf III Hybrid	Gayland Ward Seed	4.4	94	28.0	29.5	60.5	62.0	33	28	36	32	1.21	0.77	1.41	0.54	0.43	4.36*
SS635	Southern States	4.5	95	27.8	30.8	56.0	62.0	35	32	38	32	1.29	0.69	1.47	0.44	0.34	4.22*
Leafy22 Hybrid	Turner Seed	4.4	91	28.3	31.0	58.5	62.0	32	32	36	32	0.93	0.65	1.65	0.59	0.39	4.20*
SS1562M BMR ³	Southern States	3.8	95	27.0	27.0	40.8	58.0	29	25	26	19	1.06	0.77	1.47	0.41	0.31	4.02*
PearlMil	DynaGro	3.6	79	27.5	31.5	59.5	62.0	32	34	41	35	0.95	0.66	1.54	0.60	0.26	4.00*
Pennleaf Hybrid	Pennington Seed	3.0	73	26.8	29.3	58.0	62.0	29	29	34	29	1.00	0.67	1.41	0.52	0.27	3.88*
Wonderleaf	Alta Seed/Ramer Seed	3.9	80	34.3	29.5	61.0	62.0	41	29	48	31	1.30	0.63	1.23	0.44	0.23	3.83*
PP102M Hybrid	Cisco Seed	3.3	70	43.3	33.8	62.0	61.0	41	29	45	29	1.20	0.62	1.41	0.37	0.20	3.79*
Epic BMR	Coffey Seed	3.8	86	26.8	27.3	37.3	61.0	27	24	25	21	0.84	0.77	1.54	0.27	0.35	3.77*
SweetSummer	Cisco Seed	3.9	91	27.5	28.5	34.5	60.5	31	26	25	20	0.96	0.77	1.42	0.36	0.21	3.72
Prime360	Byron Seed	3.1	80	27.0	27.5	42.3	61.0	28	26	26	20	0.83	0.68	1.31	0.42	0.29	3.53
Exceed BMR	Coffey Seed	3.4	83	27.0	27.8	41.3	62.0	29	26	26	24	0.89	0.71	1.08	0.38	0.39	3.45
Experimental Varieties																	
18183	Gayland Ward Seed	5.0	98	27.0	29.5	62.0	62.0	34	29	38	32	1.20	0.65	1.59	0.61	0.39	4.43*
LeafyTR-9	Coffey Seed	3.5	79	27.5	29.3	49.8	62.0	32	29	33	28	0.90	0.76	1.29	0.68	0.55	4.18*
LeafyTR-7	Coffey Seed	3.8	88	27.3	29.0	55.0	61.5	31	27	32	26	0.93	0.68	1.47	0.32	0.44	3.84*
Mean		3.8	85	28.9	29.4	51.9	61.4	32	28	34	27	1.03	0.70	1.42	0.46	0.34	3.95
CV,%		13.2	11	10.0	8.5	14.4	1.7	8	9	7	12	20.19	21.23	16.86	31.58	38.38	11.79
LSD,0.05		0.7	13	4.1	3.6	10.7	1.5	4	4	4	5	0.30	0.21	0.34	0.21	0.18	0.66

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 3 for complete scale.

³ BMR (brown midrib) means that a variety has been developed to produce lower amounts of lignin, which usually translates into higher quality.

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

Nitrogen application: 60 lb/A of actual nitrogen on May 16 and 30 lb/A of actual nitrogen on July 3 (Total of 90 lb of N/acre).

Table 18. Dry matter yields, stand rating, maturity, and plant height of pearl millet varieties sown May 23, 2017, at Princeton, Kentucky

Variety	Proprietor/ Distributor	Percent Stand Oct 25	Maturity ¹ Aug 1	Plant Height (in) Aug 1	Yield (DM tons/acre)		
					Aug 1	Oct 25	Total
Commercial Varieties-Available for Farm Use							
FSG 300 Hybrid	Farm Science Genetics	95	52.5	54	2.18	1.85	4.02*
Leafy22 Hybrid	Turner Seed	97	44.5	47	2.39	1.56	3.95*
Tifleaf III Hybrid	Gayland Ward Seed	93	45.8	51	2.26	1.68	3.93*
SS635	Southern States	93	38.3	46	2.14	1.55	3.69*
FSG 315 BMR ² (Dwarf)	Farm Science Genetics	93	31.5	33	1.71	1.62	3.33*
SS501	Southern States	68	54.5	65	2.38	0.70	3.07
Pennleaf Hybrid	Pennington Seed	76	51.8	43	1.76	1.14	2.90
PP102M Hybrid	Cisco Seeds	50	58.0	68	2.10	0.53	2.64
Mean		83	47.1	51	2.12	1.33	3.44
CV,%		15	13.5	13	17.03	26.44	14.42
LSD,0.05		19	9.3	10	0.53	0.52	0.73

¹ Maturity rating scale: 37 = flag leaf emergence, 45 = boot swollen, 50 = beginning of inflorescence emergence, 58 = complete emergence of inflorescence, 62 = beginning of pollen shed. See Table 3 for complete scale.

² BMR (brown midrib) means that a variety has been developed to produce lower amounts of lignin, which usually translates into higher quality.

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

Nitrogen application: 75 lb/A of actual nitrogen on May 30.

Table 19. Dry matter yields and plant height of pearl millet varieties sown June 8, 2018, at Princeton, Kentucky

Variety	Proprietor/ Distributor	Plant Height (in)		Yield (DM tons/acre)		
		Jul 26	Sep 17	Jul 26	Sep 17	Total
Commercial Varieties-Available for Farm Use						
SS635	Southern States	51	42	2.59	0.64	3.23*
Tifleaf III Hybrid	Gayland Ward Seed	48	46	2.48	0.68	3.16*
PP102M Hybrid	Cisco Seeds	65	49	2.28	0.64	2.93*
Leafy22 Hybrid	Turner Seed	53	47	2.27	0.56	2.83*
Wonderleaf	Alta Seed/Ramer Seed	62	51	2.30	0.52	2.82*
SS501	Southern States	65	60	1.93	0.79	2.72*
PennLeaf Hybrid	Pennington Seed	49	43	2.05	0.58	2.63*
Sweet Summer	Cisco Seeds	42	43	1.66	0.73	2.39*
Mean		55	48	2.19	0.63	2.82
CV,%		7	12	27.83	50.09	22.08
LSD,0.05		5	8	0.90	0.47	0.92

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

Nitrogen application: 60 lb/A actual nitrogen on June 8 and July 26 (Total of 120 lb of N/acre).

Table 20. Dry matter yields, maturity, and plant height of pearl millet varieties sown May 29, 2019, at Princeton, Kentucky

Variety	Proprietor/ Distributor	Maturity ¹ Jul 26	Plant Height (in)			Yield (DM tons/acre)				
			Jul 3	Jul 26	Aug 29	Jul 3	Jul 26	Sep 3	Nov 5	Total
Commercial Varieties-Available for Farm Use										
Leafy22 Hybrid	Turner Seed	34.0	31	42	45	1.72	2.31	2.70	0.49	7.22*
Tifleaf III Hybrid	Gayland Ward Seed	39.3	30	40	40	1.68	2.29	2.32	0.62	6.91*
PearlMil	Dyna-Gro Seed	37.5	30	41	42	1.61	2.13	2.76	0.35	6.84*
Wonderleaf	Alta Seed/Ramer Seed	35.3	36	37	50	2.01	1.86	2.54	0.25	6.66*
SS635	Southern States	36.3	30	39	40	1.56	2.17	2.39	0.43	6.55*
SweetSummer	Cisco Seed	34.5	29	31	34	1.66	2.13	2.48	0.19	6.46*
Prime360	Byron Seed	34.3	29	34	37	1.46	2.01	2.35	0.58	6.40
Exceed BMR ²	Coffey Seed	34.0	29	32	37	1.67	2.11	2.35	0.18	6.31
Epic BMR	Coffey Seed	34.8	29	30	35	1.61	2.14	2.11	0.31	6.17
SS1562M BMR	Southern States	34.0	28	30	35	1.30	2.12	2.16	0.32	5.90
PP102M Hybrid	Cisco Seed	38.5	33	35	45	1.61	2.01	1.99	0.29	5.90
Experimental Varieties										
LeafyTR-7	Coffey Seed	36.3	30	36	40	1.74	2.08	2.90	0.48	7.20*
18183	Gayland Ward Seed	38.0	29	38	40	1.84	2.27	2.51	0.49	7.10*
LesfyTR-9	Coffey Seed	34.8	30	38	41	1.61	2.15	2.63	0.62	7.01*
Mean		35.8	30	36	40	1.65	2.13	2.44	0.40	6.62
CV,%		7.6	5	12	8	9.08	12.82	18.13	67.18	8.51
LSD,0.05		3.9	2	6	4	0.21	0.39	0.63	0.38	0.81

¹ Maturity rating scale: 37 = flag leaf emergence, 45 = boot swollen, 50 = beginning of inflorescence emergence, 58 = complete emergence of inflorescence, 62 = beginning of pollen shed. See Table 3 for complete scale.

² BMR (brown midrib) means that a variety has been developed to produce lower amounts of lignin, which usually translates into higher quality. Nitrogen application: 60 lb/A of actual nitrogen on May 22 and 60 lb/A of actual nitrogen on July 10 and July 29 (Total of 180 lb of N/acre).

Table 21. Dry matter yields, seedling vigor, stand rating, heading date, aphid damage, plant height, and maturity of forage sorghum varieties sown May 17, 2017, at Lexington, Kentucky

Variety	Proprietor/ Distributor	Seedling Vigor ¹ Jun 14	Percent Stand Jun 14	Heading Date ²	Sugarcane Aphid Injury ³ Sep 21	Plant Height(ft) Sep 21	Maturity ⁴ Sep 21	Yield (DM tons/acre) Sep 21
Commercial Varieties-Available for Farm Use								
SS405	S & W Seed Company	4.3	82	Aug 24	4	10.8	82.5	10.25*
1990	S & W Seed Company	3.8	64	did not head	2	10.0	29.0	9.29
FSG114 BMR ⁵	Farm Science Genetics	3.9	82	Aug 3	5	8.9	93.0	9.24
NK300	S & W Seed Company	4.3	89	Aug 13	8	6.5	91.5	8.61
Ensilemaster	Caudill Seed	3.1	70	Aug 23	5	9.2	80.8	8.25
GW2120	Gayland Ward Seed	2.0	43	Aug 6	5	9.0	93.0	7.93
GW400 BMR	Gayland Ward Seed	3.9	82	Aug 1	4	8.9	89.5	6.75
AF7401 BMR (Brachytic Dwarf)	Advanta Seed/Ramer Seed	3.5	88	Aug 19	4	5.8	88.0	6.37
FSG115 BMR (Brachytic Dwarf)	Farm Science Genetics	3.9	70	Aug 19	6	6.8	83.0	6.03
SD1741 BMR	S & W Seed Company	4.3	85	Jul 31	3	9.3	91.0	5.97
XF7203 BMR (Brachytic Dwarf)	Advanta Seed/Ramer Seed	3.8	86	Aug 1	9	5.9	93.0	5.50
KFFiber-Pro70FS	Byron Seed	3.5	74	Aug 20	4	6.6	75.0	4.80
Experimental Varieties								
X50711	Scott Seed	4.3	89	Aug 18	6	9.6	82.5	11.89*
X50644	Scott Seed	4.3	94	did not head	3	8.4	29.0	9.20
X5063	Scott Seed	3.0	63	Aug 8	4	8.8	92.5	8.38
X51423	Scott Seed	3.4	76	Aug 13	7	8.6	88.5	7.83
X50652	Scott Seed	3.6	96	did not head	2	6.8	29.0	6.80
X50610	Scott Seed	4.0	82	Aug 15	5	5.9	75.0	6.54
Mean		3.7	78	Aug 12	5	8.1	73.5	7.76
CV,%		25.4	23	5 days	33	8.0	9.3	21.35
LSD,0.05		1.3	25	6 days	2	1.0	5.5	2.35

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. Those without a date are photoperiod sensitive and remain vegetative all season.

³ Aphid damage score based on a scale of 1 to 9 with 9 indicating all leaves affected by aphids.

⁴ Maturity rating scale: 29=9 or more elongated sheaths, 45=boot swollen, 62=beginning of pollen shed, 75=endosperm milky, 93=endosperm hard and dry.

See Table 3 for complete scale.

⁵ BMR (brown midrib) means that a variety has been developed to produce lower amounts of lignin, which usually translates into higher quality.

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

Nitrogen application: 50 lb/A of actual nitrogen on May 18.

Table 22. Dry matter yields, seedling vigor, stand rating, heading date, plant height, lodging, and maturity of forage sorghum varieties Sown May 29, 2018, at Lexington, Kentucky

Variety	Proprietor/ Distributor	Seedling Vigor ¹ Jun 13	Percent Stand Jun 13	Heading Date ²	Lodging ³ Sep 18	Plant Height(ft) Sep 18	Maturity ⁴ Sep 18	Yield (DM tons/acre) Sep 18
Commercial Varieties-Available for Farm Use								
SS405	S & W Seed Company	3.8	94	Aug 29	0.0	14.0	87.0	14.05*
1990	S & W Seed Company	3.5	92	did not head	0.0	13.6	29.0	12.29*
NK300	S & W Seed Company	4.5	96	Aug 19	3.3	7.1	91.0	9.39
Ensilemaster	Caudill Seed	3.5	86	Aug 24	2.3	12.0	91.0	8.98
FSG114 BMR ⁵	Farm Science Genetics	3.3	93	Aug 5	4.8	7.9	93.5	6.31
GW600 BMR	Gayland Ward Seed	4.0	95	Aug 4	7.0	9.9	93.0	6.26
GW400 BMR	Gayland Ward Seed	3.1	86	Aug 3	8.5	8.5	93.0	6.14
GW2120	Gayland Ward Seed	2.5	85	Aug 6	0.3	9.4	91.0	6.11
SD1741 BMR	S & W Seed Company	4.5	99	Aug 2	0.8	9.3	85.5	5.82
GW475 BMR	Gayland Ward Seed	3.6	96	Aug 6	8.0	9.5	93.0	5.54
FSG115 BMR (Brachytic Dwarf)	Farm Science Genetics	3.5	86	Aug 27	0.0	7.8	88.5	5.17
XF7203 BMR (Brachytic Dwarf)	Advanta Seed/Ramer Seed	2.8	90	Aug 2	8.5	5.8	91.0	5.04
AF7401 BMR (Brachytic Dwarf)	Advanta Seed/Ramer Seed	3.0	88	Aug 27	0.3	7.9	93.0	5.02
SiloPro BMR (Dwarf)	Gayland Ward Seed	2.5	70	Aug 24	0.0	7.9	88.0	4.41
KFFiber-Pro70F	Byron Seed	2.9	71	Aug 28	0.3	8.5	89.0	3.69
Mean		3.4	88	Aug 14	2.9	9.3	90.5	6.95
CV,%		15.9	8	3 days	47.6	15.5	3.1	22.75
LSD,0.05		0.8	10	4 days	2.0	2.1	4.0	2.26

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. Those without a date are photoperiod sensitive and remain vegetative all season.

³ Lodging score based on a scale of 0 to 9. 0 indicating no lodging and 9 indicating all plants lodged.

⁴ Maturity rating scale: 29=9 or more elongated sheaths, 45=boot swollen, 62=beginning of pollen shed, 75=endosperm milky, 93=endosperm hard and dry.

See Table 3 for complete scale.

⁵ BMR (brown midrib) means that a variety has been developed to produce lower amounts of lignin, which usually translates into higher quality.

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

Nitrogen application: 60 lb/A of actual nitrogen on June 1.

Table 23. Dry matter yields, seedling vigor, stand rating, heading date, aphid damage, lodging, plant height, and maturity of forage sorghum varieties sown May 17, 2019, at Lexington, Kentucky

Variety	Proprietor/ Distributor	Seedling Vigor ¹ Jun 5	Percent Stand Jun 5	Heading Date ²	Sugarcane Aphid Injury ³ Sep 12	Lodging ⁴ Sep 12	Plant Height (ft) Sep 12	Maturity ⁵ Sep 12	Yield (DM tons/acre) Sep 12
Commercial Varieties-Available for Farm Use									
SS405	S & W Seed Company	3.6	84	Aug 22	3	0.0	10.0	92.5	10.87*
TopTon	Dyna-Gro Seed	4.1	88	Aug 18	2	1.8	10.0	86.5	10.18*
F74FS23 BMR ⁶	Dyna-Gro Seed	4.3	91	Aug 3	2	0.3	8.8	92.5	9.78*
SS1515	Southern States	3.6	90	Aug 8	3	1.3	6.8	91.0	9.77*
Super Sile 30	Dyna-Gro Seed	3.9	90	Aug 21	4	0.0	9.8	84.5	9.43*
Ensilemaster	Caudill Seed	3.5	90	Aug 15	3	1.0	9.6	92.0	9.23*
1990	S & W Seed Company	3.8	76	did not head	1	0.0	10.3	29.0	8.80
Super Sile 20	Dyna-Gro Seed	3.3	91	Aug 20	3	0.0	10.0	84.5	8.37
F75FS13	Dyna-Gro Seed	3.3	82	Jul 31	2	0.3	9.8	93.0	8.35
GW2120	Gayland Ward Seed	3.0	76	Jul 30	2	0.5	9.3	92.5	7.97
GW600 BMR	Gayland Ward Seed	4.6	89	Jul 30	1	2.3	10.3	92.5	7.80
GW475 BMR	Gayland Ward Seed	4.4	90	Jul 28	2	0.3	8.1	92.5	7.69
AF8301	Advanta Seed/Ramer Seed	4.6	88	Aug 5	2	0.0	7.3	91.5	7.67
SD1741 BMR	S & W Seed Company	4.4	84	Jul 27	2	0.0	9.8	93.0	7.44
AF7201 BMR	Advanta Seed/Ramer Seed	3.9	88	Jul 23	2	0.0	8.9	93.0	7.34
F74FS72 BMR	Dyna-Gro Seed	3.0	90	Aug 14	3	0.0	5.5	90.5	7.22
ADVF7232 BMR	Advanta Seed/Ramer Seed	3.6	91	Aug 13	3	0.0	5.8	86.5	6.85
AF7401 BMR	Advanta Seed/Ramer Seed	3.5	88	Aug 12	1	0.5	5.5	89.5	6.65
NK300	S & W Seed Company	4.1	84	Aug 6	4	1.5	6.6	92.0	6.53
GW400BMR	Gayland Ward Seed	4.0	90	Jul 22	2	0.5	7.6	92.5	6.45
FSG114 BMR	Farm Science Genetics	3.8	84	Jul 27	3	1.3	9.0	93.0	5.93
FSG115 BMR(Brachytic Dwarf)	Farm Science Genetics	3.0	74	Aug 12	3	0.3	6.0	88.5	5.25
XF7203 BMR(Brachytic Dwarf)	Advanta Seed/Ramer Seed	3.1	83	Jul 28	2	9.5	7.5	88.5	3.73
Experimental Varieties									
FX19133	Dyna-Gro Seed	3.4	74	Aug 21	4	0.0	6.9	86.5	9.22*
ADVXF033	Advanta Seed/Ramer Seed	4.5	88	Aug 13	2	0.3	7.1	90.5	8.96
19156	Gayland Ward Seed	3.0	50	Aug 5	1	0.8	10.6	92.0	8.69
19055	Gayland Ward Seed	3.4	91	Jul 30	3	2.3	8.8	92.5	8.69
18116 BMR	Gayland Ward Seed	4.4	83	Jul 29	1	1.3	8.8	93.0	8.40
19176 BMR	Gayland Ward Seed	4.0	78	Aug 10	3	1.0	10.0	92.5	8.31
ADVXF025 BMR	Advanta Seed/Ramer Seed	4.0	85	Jul 26	1	0.3	9.9	92.0	8.20
18117 BMR	Gayland Ward Seed	3.9	89	Jul 26	2	2.5	8.6	92.5	8.01
19042	Gayland Ward Seed	3.5	88	Aug 23	1	0.0	7.1	80.0	7.93
18118 BMR	Gayland Ward Seed	4.3	88	Jul 26	2	0.3	8.9	93.0	7.59
18487	Gayland Ward Seed	3.8	93	Aug 1	2	0.0	8.3	86.5	7.53
19155 BMR	Gayland Ward Seed	3.6	96	Jul 30	4	0.3	7.8	92.5	7.41
19174 BMR	Gayland Ward Seed	3.6	88	Aug 11	4	0.3	8.4	89.0	7.36
19047 BMR	Gayland Ward Seed	3.9	84	Jul 30	2	1.3	8.5	93.0	7.15
18119 BMR	Gayland Ward Seed	4.4	93	Jul 25	1	0.8	7.4	93.0	7.14
19177 BMR	Gayland Ward Seed	3.9	81	Aug 3	3	0.8	8.8	92.5	7.13
19038	Gayland Ward Seed	4.3	85	Aug 21	5	0.0	6.5	84.0	6.85
19179	Gayland Ward Seed	3.3	61	Aug 19	1	0.0	6.0	82.5	6.60
18096	Gayland Ward Seed	4.1	90	Aug 1	3	0.0	5.8	93.0	6.51
19175BMR	Gayland Ward Seed	3.3	70	Jul 31	2	0.3	8.4	92.5	6.44
18351	Gayland Ward Seed	3.6	89	Aug 3	1	0.0	7.8	88.5	6.43
19178 BMR	Gayland Ward Seed	4.0	87	Aug 5	2	0.3	9.5	90.5	5.55
FX19178 BMR	Dyna-Gro Seed	3.6	78	Aug 8	3	1.5	5.4	93.0	5.28
19181BMR	Gayland Ward Seed	3.6	88	Jul 26	5	0.0	5.0	93.0	4.93
19040	Gayland Ward Seed	3.8	81	Aug 13	2	0.0	6.3	87.0	4.73
Mean		3.8	84	Aug 5	2	0.7	8.1	90.4	7.51
CV,%		16.6	11	4 days	57	156.4	9.4	4.2	17.50
LSD,0.05		0.9	13	5 days	2	1.6	1.1	5.2	1.84

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. Those without a date are photoperiod sensitive and remain vegetative all season.

³ Aphid damage score based on a scale of 1 to 9 with 9 indicating all leaves affected by aphids.

⁴ Lodging score based on a scale of 0 to 9. 0 indicating no lodging and 9 indicating all plants lodged.

⁵ Maturity rating scale: 29=9 or more elongated sheaths, 45=boot swollen, 62=beginning of pollen shed, 75=endosperm milky, 93=endosperm hard and dry.

See Table 3 for complete scale.

⁶ BMR (brown midrib) means that a variety has been developed to produce lower amounts of lignin, which usually translates into higher quality.

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

Nitrogen application: 120 lb/A of actual nitrogen on May 15.

Table 24. Dry matter yields, aphid damage, plant height, lodging, and maturity of forage sorghum varieties sown June 1, 2017, at Princeton, Kentucky

Variety	Proprietor/ Distributor	Sugarcane Aphid Injury ¹ Aug 31	Plant Height(ft) Oct 25	Lodging ² Oct 25	Maturity ³ Oct 25	Yield ⁴ (DM tons/acre) Oct 25
Commercial Varieties-Available for Farm Use						
Ensilemaster	Caudill Seed	5	7.9	0.8	93.0	7.43*
SS405	S & W Seed Company	5	9.8	1.5	93.0	6.93*
1990	S & W Seed Company	4	7.5	0.0	51.3	5.68
NK300	S & W Seed Company	6	5.4	0.0	93.0	5.18
AF7401 BMR ⁵ (Brachytic Dwarf)	Advanta Seed/Ramer Seed	5	5.3	0.0	92.0	5.02
SD1741BMR	S & W Seed Company	5	7.9	0.3	93.0	4.07
GW2120	Gayland Ward Seed	8	6.5	1.0	93.0	3.68
FSG115 BMR (Brachytic Dwarf)	Farm Science Genetics	6	4.1	0.3	90.5	3.14
FSG114 BMR	Farm Science Genetics	8	6.4	7.8	92.0	3.07
XF7203 BMR (Brachytic Dwarf)	Advanta Seed/Ramer Seed	7	4.4	7.5	93.0	3.03
KFFiber-Pro70FS	Byron Seed	7	4.1	0.5	91.0	3.03
GW400 BMR	Gayland Ward Seed	8	5.1	8.0	88.0	1.82
Experimental Varieties						
X50711	Scott Seed	5	8.2	1.5	93.0	6.77*
X50652	Scott Seed	5	5.9	0.0	53.5	6.23*
X50644	Scott Seed	6	6.1	0.8	45.0	4.10
X51423	Scott Seed	7	5.9	0.3	91.5	3.12
X50610	Scott Seed	6	4.0	0.0	92.5	2.60
X5063	Scott Seed	8	5.6	8.8	92.0	2.28
Mean		5	6.1	2.2	85.0	4.29
CV,%		11	12.0	44.2	2.1	25.18
LSD,0.05		1	1.1	1.4	2.6	1.53

¹ Aphid damage score based on a scale of 1 to 9 with 9 indicating all leaves affected by aphids.

² Lodging score based on a scale of 0 to 9. 0 indicating no lodging and 9 indicating all plants lodged.

³ Maturity rating scale: 45=boot swollen, 62=beginning of pollen shed, 75=endosperm milky, 93=endosperm hard and dry. See Table 3 for complete scale.

⁴ Yields were influenced by late harvest resulting in significant leaf senescence.

⁵ BMR (brown midrib) means that a variety has been developed to produce lower amounts of lignin, which usually translates into higher quality.

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

Nitrogen application: 150 lb/A of actual nitrogen on May 30.

Table 25. Dry matter yields, aphid injury, lodging, and maturity of forage sorghum varieties sown June 6, 2019, at Princeton, Kentucky

Variety	Proprietor/ Distributor	Sugarcane Aphid Injury ¹ Sep 23	Lodging ² Sep 24	Maturity ³ Sep 24	Yield (DM tons/acre) Sep 30
Commercial Varieties-Available for Farm Use					
SS405	S&W Seed Company	8	0.3	93.0	12.59*
SP1615	S&W Seed Company	6	0.0	29.0	12.51*
Super Sile 20	Dyna-Gro Seed	7	1.8	85.5	9.11
F74FS72 BMR ⁴	Dyna-Gro Seed	6	0.0	87.0	8.63
GW2120	Gayland Ward Seed	5	0.0	86.5	8.49
Super Sile 30	Dyna-Gro Seed	8	2.3	88.0	7.64
AF7401 BMR	Advanta Seed/Ramer Seed	6	0.0	87.0	7.33
EnsileMaster	Caudill Seed	7	9.0	89.0	6.27
AF8301	Advanta Seed/Ramer Seed	7	1.3	86.0	6.22
ADVF7232 BMR	Advanta Seed/Ramer Seed	6	0.0	85.0	6.18
F75FS13	Dyna-Gro Seed	6	2.0	87.0	6.17
AF7201 BMR	Advanta Seed/Ramer Seed	8	1.3	87.0	6.10
FSG114 BMR	Farm Science Genetics	6	2.0	87.0	5.80
F74FS23 BMR	Dyna-Gro Seed	8	8.0	89.5	5.60
SS1515	Southern States	6	2.8	89.0	5.54
FSG115 BMR (Brachytic Dwarf)	Farm Science Genetics	8	1.3	87.0	5.42
TopTon	Dyna-Gro Seed	7	9.0	87.0	5.37
Experimental Varieties					
FX19133	Dyna-Gro Seed	8	0.0	87.0	10.34*
19156	Gayland Ward Seed	6	3.0	86.5	10.23*
19038	Gayland Ward Seed	6	0.0	87.0	7.96
ADVXF033	Advanta Seed/Ramer Seed	7	0.0	87.0	7.69
19176 BMR	Gayland Ward Seed	7	4.8	86.5	7.61
18096	Gayland Ward Seed	4	0.0	86.5	7.54
ADVXFO25 BMR	Advanta Seed/Ramer Seed	6	3.5	86.0	7.45
19177 BMR	Gayland Ward Seed	7	7.3	86.5	7.43
19042	Gayland Ward Seed	5	0.3	91.0	7.37
18118 BMR	Gayland Ward Seed	8	1.3	87.0	7.09
19175 BMR	Gayland Ward Seed	6	4.0	86.5	6.94
19178 BMR	Gayland Ward Seed	6	5.8	87.0	6.59
19179	Gayland Ward Seed	5	0.0	85.0	6.48
18351	Gayland Ward Seed	6	0.0	87.0	6.43
19055	Gayland Ward Seed	6	0.5	87.0	6.42
19181	Gayland Ward Seed	7	0.0	87.0	6.23
19040	Gayland Ward Seed	6	0.0	85.0	6.17
18116 BMR	Gayland Ward Seed	7	7.3	87.0	5.59
18119 BMR	Gayland Ward Seed	6	1.0	86.5	5.50
18487	Gayland Ward Seed	6	7.8	86.5	5.42
19174 BMR	Gayland Ward Seed	7	7.3	86.5	5.25
19155 BMR	Gayland Ward Seed	7	6.5	87.0	5.16
FX19178 BMR	Dyna-Gro Seed	6	0.0	85.0	4.43
19047 BMR	Gayland Ward Seed	8	5.3	87.0	4.41
18117 BMR	Gayland Ward Seed	7	8.5	88.5	3.99
Mean		7	2.7	85.7	6.91
CV,%		16	65.5	2.7	25.24
LSD,0.05		1	2.5	3.2	2.47

¹ Aphid damage score based on a scale of 1 to 9 with 9 indicating all leaves affected by aphids.

² Lodging score based on a scale of 0 to 9. 0 indicating no lodging and 9 indicating all plants lodged.

³ Maturity rating scale: 29=9 or more elongated sheaths, 45=boot swollen, 62=beginning of pollen shed, 75=endosperm milky, 93=endosperm hard and dry. See Table 3 for complete scale.

⁴ BMR (brown midrib) means that a variety has been developed to produce lower amounts of lignin, which usually translates into higher quality. Nitrogen application: 120 lb/A of actual nitrogen on May 22.

Table 26. Dry matter yields, aphid damage, lodging, and maturity of forage sorghum varieties sown June 6, 2019, at Princeton, Kentucky and sprayed with an aphicide on August 24, 2019

Variety	Proprietor/ Distributor	Sugarcane Aphid Injury ¹ Sep 23	Lodging ² Sep 24	Maturity ³ Sep 24	Yield (DM tons/acre) Sep 30
Commercial Varieties-Available for Farm Use					
SP1615	S&W Seed Company	5	0.0	29.0	14.84*
SS405	S&W Seed Company	7	0.3	93.0	12.82*
Super Sile 30	Dyna-Gro Seeds	5	3.0	85.0	11.67
AF8301	Advanta Seed/Ramer Seed	6	1.5	86.0	11.19
F75FS13	Dyna-Gro Seeds	5	1.3	87.0	9.86
Super Sile 20	Dyna-Gro Seeds	6	3.3	85.5	9.61
GW2120	Gayland Ward Seed	4	0.0	86.5	8.84
SS1515	Southern States	4	2.3	87.0	8.74
ADVF7232 BMR ⁴	Advanta Seed/Ramer Seed	5	0.0	89.0	8.43
FSG114 BMR	Farm Science Genetics	6	1.5	86.5	8.07
AF7401 BMR	Advanta Seed/Ramer Seed	5	0.0	87.0	7.86
TopTon	Dyna-Gro Seeds	5	7.8	85.0	7.58
F74FS23 BMR	Dyna-Gro Seeds	6	6.5	87.0	7.00
EnsileMaster	Caudill Seed	5	7.5	87.0	6.99
AF7201 BMR	Advanta Seed/Ramer Seed	7	3.5	87.0	6.66
FSG115 BMR (Brachytic Dwarf)	Farm Science Genetics	7	0.0	87.5	5.39
F74FS72 BMR	Dyna-Gro Seeds	5	0.0	87.0	5.32
Experimental Varieties					
FX19133	Dyna-Gro Seeds	6	0.3	89.0	13.03*
19038	Gayland Ward Seed	5	0.0	87.0	9.85
ADVXF033	Advanta Seed/Ramer Seed	5	0.0	87.0	9.40
19042	Gayland Ward Seed	4	0.0	91.0	8.63
ADVXFO25 BMR	Advanta Seed/Ramer Seed	5	3.3	87.0	8.03
19175 BMR	Gayland Ward Seed	7	2.3	86.5	8.00
18118 BMR	Gayland Ward Seed	7	1.5	87.0	7.75
19179	Gayland Ward Seed	4	0.0	87.0	7.40
19176 BMR	Gayland Ward Seed	6	5.5	87.0	7.26
19178 BMR	Gayland Ward Seed	5	4.8	86.5	7.21
19055	Gayland Ward Seed	4	0.0	87.0	7.04
18119 BMR	Gayland Ward Seed	6	0.3	86.5	7.02
19156	Gayland Ward Seed	6	6.0	86.0	6.94
18116 BMR	Gayland Ward Seed	7	7.5	86.5	6.85
19174 BMR	Gayland Ward Seed	7	4.5	86.5	6.75
18351	Gayland Ward Seed	4	0.0	86.5	6.63
18096	Gayland Ward Seed	3	0.0	87.0	6.61
19177 BMR	Gayland Ward Seed	6	5.3	86.5	6.18
18117 BMR	Gayland Ward Seed	6	6.7	87.0	6.09
19040	Gayland Ward Seed	3	0.0	87.5	6.03
19181	Gayland Ward Seed	7	0.0	87.0	5.64
FX19178 BMR	Dyna-Gro Seeds	5	0.3	87.0	5.61
18487	Gayland Ward Seed	5	6.5	86.0	5.59
19047 BMR	Gayland Ward Seed	7	3.8	87.0	5.52
19155 BMR	Gayland Ward Seed	7	5.5	87.0	4.63
Mean		6	2.4	85.7	7.91
CV,%		11	65.4	2.8	25.51
LSD,0.05		2	2.2	3.3	2.91

¹ Aphid damage score based on a scale of 1 to 9 with 9 indicating all leaves affected by aphids.

² Lodging score based on a scale of 0 to 9. 0 indicating no lodging and 9 indicating all plants lodged.

³ Maturity rating scale: 29=9 or more elongated sheaths, 45=boot swollen, 62=beginning of pollen shed, 75=endosperm milky, 93=endosperm hard and dry. See Table 3 for complete scale.

⁴ BMR (brown midrib) means that a variety has been developed to produce lower amounts of lignin which usually translates into higher quality.

Nitrogen application; 120 lb/A of actual nitrogen on May 22.

Table 27. Dry matter yields, seedling vigor, percent stand, and maturity of teff varieties sown May 21, 2015, at Lexington, Kentucky

Variety	Seedling Vigor ¹ Jun 17	Percent Stand Jun 17	Maturity ²		Yield (tons/acre)			
			Jul 20	Aug 14	Jul 20	Aug 14	Sep 17	Total
Commercial Varieties-Available for Farm Use								
Moxie	4.8	100	52.5	47.5	2.33	1.83	0.23	4.39*
HorseCandi	4.3	100	51.5	48.5	2.08	1.78	0.48	4.34*
Dessie	4.5	100	51.5	45.0	2.28	1.67	0.37	4.32*
Summer Delight	4.9	100	52.5	51.0	2.26	1.55	0.41	4.22*
Velvet	4.4	100	52.0	51.0	2.20	1.59	0.35	4.14*
Tiffany	4.9	100	52.0	46.8	2.16	1.52	0.38	4.06*
Pharoah	4.9	100	52.5	48.0	2.32	1.39	0.32	4.04*
VA-T1Brown	4.6	100	51.0	47.5	2.02	1.57	0.44	4.03*
Corvallis	4.6	100	51.0	46.3	2.15	1.58	0.26	3.99*
Experimental Varieties								
F11	4.8	100	53.0	52.5	2.18	1.51	0.25	3.95*
Mean	4.7	100	52.0	48.4	2.20	1.60	0.35	4.15
CV,%	6.7	0	2.6	5.6	12.86	12.39	38.07	9.77
LSD,0.05	0.5	0	1.9	4.0	0.41	0.29	0.19	0.59

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 3 for complete scale.

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

Nitrogen application: 50 lb/A of actual nitrogen on June 3 and July 27 (Total of 100 lb of N/acre).

Table 28. Dry matter yields, seedling vigor, stand rating, and maturity of teff varieties sown May 24, 2016, at Lexington, Kentucky

Variety	Seedling Vigor ¹ Jun 14	Percent Stand Jun 14	Maturity ²		Yield (tons/acre)			
			Jul 28	Aug 25	Jul 28	Aug 25	Oct 11	Total
Commercial Varieties-Available for Farm Use								
Moxie	4.3	100	50.0	59.5	0.69	1.21	0.74	2.64*
Tiffany	4.8	100	52.5	58.0	0.59	1.15	0.85	2.60*
Dessie	4.5	100	45.0	58.0	0.77	1.09	0.73	2.59*
Summer Delight	4.3	100	53.5	59.5	0.62	1.08	0.86	2.57*
Corvallis	4.4	100	44.0	59.0	0.69	1.13	0.70	2.52*
VA-T1-Brown	4.0	100	38.5	57.0	0.72	1.02	0.75	2.49*
Velvet	4.0	100	45.5	58.5	0.67	1.12	0.68	2.47*
Pharoah	4.3	100	51.0	55.5	0.75	0.91	0.66	2.32*
HorseCandi	4.0	100	44.0	56.5	0.46	0.83	0.75	2.03*
Experimental Varieties								
BARCW0604	4.4	100	52.0	58.5	0.70	1.33	0.73	2.76*
F11	4.5	100	38.5	56.0	0.73	1.16	0.77	2.66*
PST-CRYTE	4.3	100	43.5	56.0	0.58	0.90	0.67	2.15*
Mean	4.3	100	46.5	57.7	0.66	1.08	0.74	2.48
CV,%	19.4	0	23.5	4.4	31.70	28.64	32.51	23.86
LSD,0.05	1.2	0	15.7	3.6	0.31	0.44	0.35	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 3 for complete scale.

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

Nitrogen application: 50 lb/A of actual nitrogen on July 1, July 28 and August 31 (Total of 150 lb of N/acre).

Table 29 Dry matter yields, seedling vigor, stand rating, and maturity of teff varieties sown May 16, 2019, at Lexington, Kentucky

Variety	Seedling Vigor ¹ Jun 5	Percent Stand Jun 5	Maturity ²			Yield (tons/acre)			
			Jun 26	Jul 16	Aug 18	Jun 27	Jul 16	Aug 18	Total
Commercial Varieties-Available for Farm Use									
Moxie	3.5	99	45.0	45.0	52.5	1.14	1.44	1.16	3.74*
Tiffany	4.2	99	45.0	48.3	52.7	1.04	1.70	1.01	3.74*
Corvallis	3.9	96	45.0	46.3	53.0	1.13	1.51	1.09	3.73*
Pharaoh	4.4	100	45.0	46.3	53.0	1.29	1.11	1.07	3.47*
CW0604	3.8	100	49.3	46.3	53.5	0.95	1.57	0.95	3.47*
Velvet	3.4	95	48.8	47.5	52.5	0.94	1.53	0.98	3.45*
VAT1Brown	4.1	100	45.0	45.0	51.5	1.22	1.15	1.04	3.40*
SummerDelight	3.6	98	47.5	47.5	53.0	0.98	1.21	0.90	3.09*
Dessie	3.5	100	46.3	47.5	54.0	0.81	1.32	0.90	3.02*
HorseCandi	1.8	96	45.0	48.8	52.5	0.59	1.43	0.92	2.94*
Experimental Varieties									
BARETCT	3.7	99	48.3	50.0	52.5	1.17	1.19	1.25	3.62*
F11	4.3	78	45.0	46.3	52.5	1.17	1.27	0.92	3.36*
Mean	3.6	96	46.2	47.0	52.8	1.03	1.36	1.01	3.41
CV,%	24.7	14	3.9	5.1	2.9	32.44	25.91	20.02	16.26
LSD,0.05	1.3	20	2.7	3.6	2.3	0.49	0.52	0.30	0.82

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 3 for complete scale.

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

Nitrogen application: 60 lb/A of actual nitrogen on May 15 and 30 lb/A of actual nitrogen on June 28 (Total of 90 lb of N/acre).

Table 30. Dry matter yields and maturity of teff varieties sown May 29, 2019, at Princeton, Kentucky

Variety	Maturity ¹ Jul 26	Yield (tons/acre)			
		Jul 1	Jul 29	Sep 9	Total
Commercial Varieties-Available for Farm Use					
Pharaoh	35.0	1.51	0.88	1.44	3.83*
Tiffany	34.8	1.43	1.08	1.20	3.75*
HorseCandi	35.0	1.34	1.11	1.14	3.69*
Dessie	36.3	1.54	0.95	1.12	3.61*
SummerDelight	36.3	1.58	0.99	1.07	3.55*
Corvallis	35.0	1.37	1.07	1.02	3.55*
CW0604	36.3	1.34	1.05	1.08	3.48*
Velvet	35.0	1.45	0.97	0.98	3.43*
Moxie	35.5	1.52	1.04	0.97	3.42*
Experimental Varieties					
BARETCT	35.0	1.35	0.97	0.98	3.26*
Mean	35.4	1.44	1.01	1.10	3.56
CV,%	3.9	16.47	14.03	13.53	9.83
LSD,0.05	2.0	0.35	0.21	0.26	0.60

¹ Maturity rating scale: 37=flag leaf emergence, 45=boot swollen, 50=beginning of inflorescence emergence, 58=complete emergence of inflorescence, 62=beginning of pollen shed. See Table 3 for complete scale.

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

Nitrogen application: 60 lb/A of actual nitrogen on May 22 and 60 lb/A of actual nitrogen on July 10 and July 29 (Total of 180 lb of N/acre).

Table 31. Dry matter yields, seedling vigor and stand rating of crabgrass varieties sown May 24, 2016, at Lexington, Kentucky

Variety	Proprietor/ Distributor	Seedling Vigor ¹ Jun 14	Percent Stand Jun 14	Yield (tons/acre)			
				Jul 21	Aug 25	Oct 11	Total
Commercial Varieties-Available for Farm Use							
Impact	Barenbrug USA	4.5	98	0.92	0.81	0.88	2.62*
RedRiver	Noble Foundation	4.6	96	0.90	0.93	0.70	2.53*
Quick-N-Big	Noble Foundation	4.4	98	0.82	0.72	0.63	2.17
Mean		4.5	97	0.88	0.82	0.74	2.44
CV,%		13.5	3	15.11	16.87	32.93	6.75
LSD,0.05		1.0	6	0.23	0.24	0.42	0.28

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

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

Nitrogen application: 50 lb/A of actual nitrogen on July 1 and July 28 (Total of 100 lb of N/acre).

Table 32. Dry matter yields, seedling vigor, maturity, and stand rating of crabgrass varieties sown May 29, 2018, at Lexington, Kentucky

Variety	Proprietor/ Distributor	Seedling Vigor ¹ Jun 13	Percent Stand Jun 13	Maturity ² Jul 13	Plant Height (in) Jul 13	Yield (tons/acre)			
						Jul 13	Aug 20	Sep 21	Total
Commercial Varieties-Available for Farm Use									
RedRiver	Noble Foundation	4.8	96	45	22	1.87	2.40	0.60	4.87*
Impact	Barenbrug USA	4.5	98	45	22	1.57	2.37	0.87	4.81*
QuickNBig	Noble Foundation	5.0	100	52	29	1.71	1.58	0.53	3.82
Mean		4.8	98	47	24	1.71	2.12	0.67	4.50
CV,%		9.3	2	0	8	14.77	14.86	25.65	9.50
LSD,0.05		0.8	3	0	3	0.44	0.54	0.30	0.74

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 3 for complete scale.

*Not significantly different from the highest numerical value in the column, based on the 0.05 LSD.
Nitrogen application: 60 lb/A of actual nitrogen on June 1 and July 19 (Total of 120 lb of N/acre).

Table 33. Dry matter yields, seedling vigor, stand rating, and maturity of crabgrass varieties sown May 16, 2019, at Lexington, Kentucky

Variety	Proprietor/ Distributor	Seedling Vigor ¹ Jun 5, 2019	Percent Stand 2019		Maturity ² 2019		Yield (tons/acre) 2019			
			Jun 5	Oct 14	Jul 2	Aug 12	Jul 2	Aug 12	Oct 14	Total
Red River	Noble Foundation	4.5	99	99	45.0	58.0	1.94	2.57	0.33	4.84*
Impact	Barenbrug USA	3.5	96	96	45.0	57.5	1.78	2.64	0.35	4.77*
QuickNBig	Noble Foundation	5.0	100	9	55.0	57.5	2.22	1.34	0.02	3.58
Experimental Varieties										
BARDSiRR	Barenbrug USA	4.0	99	99	45.0	58.0	1.83	2.39	0.24	4.46*
Mean		4.1	98	79	47.0	57.7	1.91	2.32	0.26	4.49
CV,%		13.2	2	3	1.8	1.3	6.33	12.57	55.13	7.06
LSD,0.05		0.8	3	3	1.2	1.0	0.19	0.42	0.20	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 3 for complete scale.

*Not significantly different from the highest numerical value in the column, based on the 0.05 LSD.
Nitrogen application: 60 lb/A of actual nitrogen on May 15 and 30 lb/A of actual nitrogen on July 3 (Total of 90 lb of N/acre).

Table 34. Dry matter yields, maturity, and plant height of crabgrass varieties sown May 29, 2019, at Princeton, Kentucky

Variety	Proprietor/ Distributor	Maturity ¹		Plant Height (in)		Yield (tons/acre)		
		Jul 9	Aug 13	Jul 9	Aug 13	Jul 9	Aug 13	Total
Commercial Varieties-Available for Farm Use								
Impact	Barenbrug USA	33.4	56.3	22	23	1.10	1.79	2.88*
QuickNBig	Noble Foundation	48.3	58.8	32	20	1.48	1.15	2.70*
RedRiver	Noble Foundation	34.0	56.8	23	24	1.30	1.38	2.62*
Experimental Varieties								
BARDSiRR	Barenbrug USA	32.8	57.5	22	23	1.23	1.59	2.83*
Mean		36.4	57.1	24	23	1.24	1.53	2.78
CV,%		9.8	2.8	10	8	14.56	35.33	20.29
LSD,0.05		5.1	2.3	3	2	0.26	0.93	0.97

¹ Maturity rating scale: 37=flag leaf emergence, 45=boot swollen, 50=beginning of inflorescence emergence, 58=complete emergence of inflorescence, 62=beginning of pollen shed. See Table 3 for complete scale.

*Not significantly different from the highest numerical value in the column, based on the 0.05 LSD.
Nitrogen application: 60 lb/A of actual nitrogen on May 22 and 60 lb/A of actual nitrogen on July 10 (Total of 120 lb of N/acre).

Table 35. Dry matter yields, seedling vigor, stand rating and maturity of cereal crops and annual ryegrass sown March 17, 2016, at Lexington, Kentucky

Variety	Species	Proprietor/ Distributor	Seedling Vigor ¹ Apr 15	Percent Stand Apr 15	Maturity ²		Yield (tons/acre)		
					May 31	Jul 5	May 31	Jul 5	Total
Persik	Black Hulled Oat	Caldbeck Consulting	4.5	99	45.0	66.0	1.67	0.52	2.20*
Robust	Spring Oats	Ag. Alumni Seed, IN	4.9	98	52.0	66.0	1.68	0.49	2.17*
021A17815	Spring Oats	Ag. Alumni Seed, IN	5.0	99	56.5	66.0	1.74	0.38	2.12*
PST50288C	Spring Oats	Caldbeck Consulting	5.0	99	45.0	66.0	1.46	0.53	2.00*
Excell	Spring Oats	Ag. Alumni Seed, IN	4.9	99	56.0	66.0	1.64	0.32	1.97*
VNK	Spring Oats	Public	5.0	97	56.0	66.0	1.64	0.25	1.89*
Marshall	Annual Ryegrass	The Wax Company	3.5	100	56.0	66.0	0.91	0.97	1.88*
Jerry	Spring Oats	Caudill Seed	5.0	100	55.5	66.0	1.58	0.24	1.82*
PST50200	Spring Oats	Caldbeck Consulting	4.4	96	46.8	66.0	1.22	0.54	1.76
PST241	Spring Oats	Caldbeck Consulting	4.1	94	45.0	66.0	1.20	0.48	1.68
Byron	Spring Triticale	Byron Seed	5.0	99	56.0	66.0	1.18	0.17	1.35
Southern Blue	Cereal Rye	Caudill Seed	5.0	100	64.0	66.0	0.74	0.50	1.24
PST101	Spring Wheat	Caldbeck Consulting	4.8	97	45.0	66.0	0.63	0.48	1.11
AgriMAXX4	Winter Wheat	AgriMAXX Wheat Co.	4.5	99	29.0	29.0	0.13	0.38	0.51
Mean			4.7	98	50.6	63.4	1.25	0.45	1.69
CV,%			6.7	2	2.5	0.0	22.80	39.66	17.62
LSD,0.05			0.4	2	1.8	0.0	0.41	0.25	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 3 for complete scale.

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

Nitrogen application: 60 lb/A of actual nitrogen on April 19.

Table 36. Dry matter yields, seedling vigor, stand rating, and maturity of cereal crops and annual ryegrass sown March 13, 2017, at Lexington, Kentucky

Variety	Species	Proprietor/ Distributor	Seedling Vigor ¹ Apr 20	Percent Stand Apr 20	Maturity ²		Yield (tons/acre)		
					May 19	Jun 20	May 19	Jun 20	Total
Robust	Spring Oat	Ag. Alumni Seed, IN	4.0	100	45.0	56.0	2.96	1.03	4.00*
Persik	Black Hulled Oat	Caldbeck Consulting	3.4	100	45.0	56.0	2.74	1.17	3.91*
Excell	Spring Oat	Ag. Alumni Seed, IN	4.5	93	45.0	58.5	2.98	0.82	3.80*
VNK	Spring Oat	Public	3.9	97	48.8	60.0	2.59	1.07	3.66*
Jerry	Spring Oat	Caudill Seed	5.0	100	46.3	59.0	2.65	0.88	3.54*
PST50288C	Spring Oat	Caldbeck Consulting	3.6	97	45.0	57.0	2.01	1.01	3.02
PST50200	Spring Oat	Caldbeck Consulting	3.9	99	45.0	56.5	2.05	0.92	2.98
021A17815	Spring Oat	Ag. Alumni Seed, IN	4.3	98	45.0	58.5	2.15	0.81	2.97
PST241	Spring Oat	Caldbeck Consulting	3.1	98	45.0	51.3	1.73	1.21	2.93
Byron	Spring Triticale	Byron Seed	3.9	99	46.3	58.5	1.68	0.40	2.09
PST101	Spring Wheat	Caldbeck Consulting	4.5	99	48.3	59.0	1.49	0.53	2.02
Southern Blue	Cereal Rye	Caudill Seed	4.5	99	53.3	62.0	1.53	0.47	2.00
Marshall	Annual Ryegrass	The Wax Company	1.3	69	48.0	62.0	0.81	1.18	1.99
AgriMAXX4	Winter Wheat	AgriMAXX Wheat Co.	3.0	99	29.0	29.0	0.76	0.91	1.67
Mean			3.7	96	45.3	55.9	2.61	0.89	2.90
CV,%			27.1	6	5.8	4.2	21.18	28.72	23.42
LSD,0.05			1.2	9	3.8	3.4	0.78	0.36	0.97

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 3 for complete scale.

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

Nitrogen application: 60 lb/A of actual nitrogen on April 20.

Table 37. Dry matter yields, seedling vigor, stand rating, and maturity of cereal crops and annual ryegrass sown April 12, 2018, at Lexington, Kentucky

Variety	Species	Proprietor/ Distributor	Seedling Vigor ¹ May 22	Percent Stand May 22	Maturity ² Jun 14	Yield (tons/acre) Jun 14
Persik	black hulled oat	Caldbeck Consulting	4.6	99	52.8	1.95*
Excel	spring oat	Ag. Alumni Seed, IN	4.3	92	60.0	1.65*
CCSO-120	black hulled oat	Caldbeck Consulting	4.4	94	54.0	1.63*
Reins	spring oat	Ag. Alumni Seed, IN	5.0	100	59.5	1.57
Robust	spring oat	Ag. Alumni Seed, IN	4.6	97	58.0	1.57
VNK	spring oat	public	4.4	92	58.5	1.56
Saber	spring oat	Ag. Alumni Seed, IN	4.6	95	60.0	1.54
Jerry	spring oat	Caudill Seed	4.3	97	55.5	1.52
PST50288C	spring oat	Caldbeck Consulting	3.8	83	47.3	1.49
CCSO-102	spring oat	Caldbeck Consulting	3.1	74	51.8	1.47
PST241	spring oat	Caldbeck Consulting	3.3	63	45.0	1.32
PST50200	spring oat	Caldbeck Consulting	3.4	66	53.5	1.22
Marshall	annual ryegrass	The Wax Company	2.9	82	62.0	0.87
Byron	spring triticale	Byron Seed	3.0	70	43.5	0.37
TetraPrime	Italian ryegrass	Mountain View Seed	2.8	87	29.0	0.36
AgriMAXX447	winter wheat	AgriMAXX Wheat Co.	2.3	65	29.0	0.08
Mean			3.8	85	51.2	1.26
CV,%			13.0	13	5.0	19.26
LSD,0.05			0.8	18	3.7	0.34

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

² Maturity rating scale: 37=flag leaf emergence, 45=boot swollen, 50=beginning of inflorescence emergence, 58=complete emergence of inflorescence, 62=beginning of pollen shed. See Table 3 for complete scale.

*Not significantly different from the highest numerical value in the column, based on the 0.05 LSD.
Nitrogen application: 60 lb/A of actual nitrogen on April 13.

Table 38. Dry matter yields, seedling vigor, stand rating, and maturity of cereal crops and annual ryegrass sown March 19, 2019, at Lexington, Kentucky

Variety	Species	Proprietor/ Distributor	Seedling Vigor ¹ Apr 25	Percent Stand Apr 25	Maturity ²		Yield (tons/acre)		
					May 21	Jun 20	May 21	Jun 21	Total
Excell	spring oat	Ag. Alumni Seed, IN	5.0	100	45.0	58.0	2.20	0.55	2.75*
CCSO120	black hulled oat	Caldbeck Consulting	5.0	100	45.0	47.8	1.84	0.71	2.55*
Persik	black hulled oat	Caldbeck Consulting	4.6	100	45.0	47.5	1.91	0.64	2.55*
CCSO102	spring oat	Caldbeck Consulting	4.9	98	46.3	50.8	1.90	0.55	2.45*
Saber	spring oat	Ag. Alumni Seed, IN	5.0	100	50.0	59.5	1.93	0.40	2.33
Jerry	spring oat	Caudill Seed	5.0	100	45.0	46.3	1.69	0.60	2.29
VNK	spring oat	public	4.6	100	48.8	58.5	1.76	0.51	2.27
Robust	spring oat	Ag. Alumni Seed, IN	4.9	100	45.0	49.0	1.82	0.45	2.27
BCO18006	spring oat	Seed-link Inc.	4.5	99	45.0	46.3	1.56	0.64	2.20
Haywire	spring oat	Cisco Seeds	5.0	100	45.0	45.0	1.65	0.31	1.96
Marshall	annual ryegrass	The Wax Company	3.1	100	56.0	62.0	1.06	0.82	1.88
Byron	spring triticale	Byron Seed	3.6	99	45.0	60.0	1.34	0.53	1.87
BCO18007	spring oat	Seed-link Inc.	4.0	98	45.0	47.5	1.40	0.39	1.79
BCT18501	spring triticale	Seed-link Inc.	2.6	95	47.5	61.5	1.20	0.54	1.74
CCSW330	spring wheat	Caldbeck Consulting	3.8	98	45.0	58.0	0.99	0.48	1.47
Maton	cerealRye	Caudill Seed	5.0	100	56.0	62.0	0.76	0.56	1.31
TetraPrime	Italian ryegrass	Mountain View Seed	2.9	99	29.0	29.0	0.78	0.53	1.31
Dynagro9600	winter wheat	Dyna-Gro Seed	3.1	100	29.0	33.0	0.52	0.42	0.94
Mean			4.3	99	45.1	51.2	1.46	0.53	2.00
CV,%			10.0	2	2.4	6.6	15.53	31.70	12.97
LSD,0.05			0.6	2	1.6	4.8	0.32	0.16	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 3 for complete scale.

*Not significantly different from the highest numerical value in the column, based on the 0.05 LSD.
Nitrogen application: 60 lb/A of actual nitrogen on March 19.

Table 39. Dry matter yields, stand rating, and maturity of cereal crops sown September 20, 2018, at Lexington, Kentucky (early first harvest)

Variety	Species	Proprietor/ Distributor	Percent Stand 2018	Maturity ¹		Yield (tons/acre)		
			Sep 28	Apr 10	May 10	Apr 10	May 10	Total
Elbon	rye	Noble Foundation/Caudill Seed	100	45.0	58.0	3.50	1.41	4.91*
Maton	rye	Noble Foundation/Caudill Seed	100	45.0	58.0	3.24	1.31	4.55*
SouthernBlue	rye	Caudill Seed	100	45.0	58.0	2.76	1.23	4.00
Forerunner	triticale	Cisco Seeds	100	31.5	53.5	2.06	1.44	3.50
Bobcat	triticale	Fabian Seed Farms	100	32.0	55.5	2.02	1.18	3.20
DG9701	wheat	Dyna-Gro Seed	100	31.0	53.0	1.53	1.33	2.85
DG9600	wheat	Dyna-Gro Seed	100	31.3	53.0	1.55	1.25	2.80
DG9750	wheat	Dyna-Gro Seed	100	31.0	54.0	1.51	1.28	2.79
Mean			100	36.5	55.4	2.27	1.30	3.57
CV,%			0	0.8	3.1	10.43	13.65	9.74
LSD,0.05			0	0.4	2.5	0.35	0.26	0.51

¹ Maturity rating scale: 37=flag leaf emergence, 45=boot swollen, 50=beginning of inflorescence emergence, 58=complete emergence of inflorescence, 62=beginning of pollen shed. See Table 3 for complete scale.

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

Table 40. Dry matter yields, stand rating, and maturity of cereal crops sown September 20, 2018, at Lexington, Kentucky

Variety	Species	Proprietor/ Distributor	Percent Stand 2018	Maturity ¹	Yield (tons/acre)
			Sep 28	May 10	May 10
Forerunner	triticale	Cisco Seeds	100	64	5.12*
Elbon	rye	Noble Foundation/Caudill Seed	100	75	4.65*
Maton	rye	Noble Foundation/Caudill Seed	100	75	4.53
Bobcat	triticale	Fabian Seed Farms	100	64	4.41
DG9750	wheat	Dyna-Gro Seed	100	66	3.99
SouthernBlue	rye	Caudill Seed	100	75	3.94
DG9600	wheat	Dyna-Gro Seed	100	66	3.93
DG9701	wheat	Dyna-Gro Seed	100	66	3.80
Mean			100	68.9	4.29
CV,%			0	0	8.11
LSD,0.05			0	0	0.51

¹ Maturity rating scale: 37=flag leaf emergence, 45=boot swollen, 50=beginning of inflorescence emergence, 58=complete emergence of inflorescence, 62=beginning of pollen shed. See Table 3 for complete scale.

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

Table 41. Dry matter yields of wheat variation sown October 17, 2018, at Lexington, Kentucky, originally appeared in PR-760 Table 4 (uky.edu/ag/WheatVarietyTest)

Variety	Soft Dough Stage (tons/acre)			Boot Stage (tons/acre)	Cover Crop/ Grazing (tons/acre)	Head Type
	2019	2018-19	2017-19	2019	2019	
	May 28			April 30	March 13	
PROGENY #BLAZE	3.06	3.20	3.59	1.69	0.14	Bearded
USG 3404	3.05	3.25	3.51	1.65	0.12	Bearded
KWS 19X09	3.02			1.73	0.21	Bearded
CROPLAN CP9606	3.02	3.21	3.59	1.78	0.14	Bearded
ARMOR ARW1816	2.98			1.97	0.17	Bearded
ARMOR ARW1815	2.96			1.90	0.14	Bearded
Go Wheat EXP18-2	2.91			1.83	0.17	Bearded
Dyna-Gro 9941	2.90	2.97		2.22	0.15	Bearded
AgriMAXX 486	2.88	3.21	3.73	1.67	0.15	Bearded
KAS Truman 18X6	2.88	3.39		1.80	0.13	Bearded
Dyna-Gro WX19714	2.85			1.84	0.12	Bearded
LOCAL LW Ex19D	2.84			1.67	0.13	Bearded
ARMOR VELOCITY	2.84			1.88	0.16	Bearded
KWS 19X03	2.81			1.64	0.13	Awnless
X12-619-205-14-1	2.78			1.97	0.15	Bearded
USG 3316	2.75	3.13	3.54	1.75	0.13	Bearded
GoWheat 2058	2.75	3.07	3.25	1.72	0.12	Bearded
SYNGENTA SX 8146	2.75			1.26	0.10	Bearded
KY09C-1245-99-12-3	2.74	3.06		1.86	0.19	Tip-Awned
ARMOR ARW1819	2.74			1.81	0.11	Bearded
Dyna-Gro WX19713	2.73			1.44	0.14	Bearded
SYNGENTA SY 100	2.67	3.00	3.30	1.38	0.14	Awnless
AgriMAXX EXP 1906	2.66			1.87	0.14	Bearded
X10-0594-7-1-3	2.66			2.08	0.13	Awnless
Pioneer variety 26R59	2.65	3.23	3.58	1.94	0.11	Awnless
PEMBROKE 2016	2.63	2.89	3.26	1.56	0.13	Bearded
KY07C-1145-94-12-5	2.61	2.95	3.49	1.39	0.11	Awnless
LCS L11719	2.60	3.09		1.62	0.12	Bearded
Sunny South SS700	2.59			1.42	0.14	Awnless
LOCAL LW 2958	2.59			1.64	0.12	Bearded
X12-3010-3-5-3	2.58			1.79	0.10	Tip-Awned
Dyna-Gro WX18416	2.58			1.54	0.10	Bearded
USG 3329	2.56	2.95		1.69	0.11	Bearded
ARMOR ARW1766	2.56	3.18		1.89	0.18	Bearded
Go Wheat EXP18-1	2.55			1.55	0.11	Awnless
Dyna-Gro 9862	2.55	2.96	3.36	1.58	0.10	Awnless
X11-0420-120-13-3	2.52			1.71	0.12	Bearded
KY09C-1245-99-1-5	2.52			1.46	0.13	Awnless
LOCAL LW 2867	2.50			1.31	0.09	Awnless
AgriMAXX 485	2.50	2.92	3.28	1.51	0.08	Awnless
AgriMAXX 454	2.49	3.02	3.36	1.49	0.12	Bearded
DH12SRW057-006	2.48			1.58	0.16	Awnless
AgriMAXX 463	2.47	2.80	3.28	1.68	0.12	Awnless
ARMOR RAGE	2.46	3.02	3.49	1.39	0.12	Bearded
Dyna-Gro WX19711	2.45			1.69	0.12	Bearded
KAS 19X9EX	2.45			1.72	0.14	Bearded
LCS L11713	2.45			1.81	0.13	Bearded
SYNGENTA SY 547	2.44	2.92	3.36	1.78	0.15	Awnless
KAS Roosevelt	2.43	2.80		1.69	0.09	Bearded
SYNGENTA SY VIPER	2.43	3.32	3.61	1.43	0.09	Awnless
Pioneer variety 26R41	2.42	3.05	3.40	1.77	0.14	Bearded
KY06C-1178-16-10-3-34	2.42			1.40	0.10	Bearded
PEMBROKE 2008	2.42	3.01	3.22	1.53	0.07	Bearded
PROGENY PGX 18-8	2.42			2.32	0.10	Bearded
PROGENY PGX 18-2	2.41			1.68	0.11	Bearded
ARMOR MAYHEM	2.41	2.87	3.53	1.63	0.17	Bearded
PROGENY PGX 17-16	2.40	2.99		1.31	0.12	Bearded
AgriMAXX 473	2.39	2.88	3.29	1.53	0.16	Bearded
CROPLAN CP8800	2.38			1.65	0.13	Bearded

continued

Table 4 (continued)

VARIETY	Soft Dough Stage Tons/acre			Boot Stage Tons/acre	Cover Crop / Grazing Tons/acre	Head Type
	2019	2018-19	2017-19	2019	2019	
AgriMAXX EXP 1913	2.37			1.65	0.12	Bearded
SYNGENTA SX 8186	2.36			1.72	0.14	Awnless
CROPLAN CP9415	2.35	3.02	3.41	1.73	0.15	Bearded
Dyna-Gro 9701	2.33	2.81	3.33	1.80	0.15	Bearded
PEMBROKE 2014	2.32	2.87	3.31	2.13	0.11	Bearded
CROPLAN CP8550	2.31	2.82	3.42	1.62	0.14	Bearded
PROGENY #WARRIOR	2.30	2.69	3.00	1.46	0.12	Awnless
KY10-0178-1-2-5	2.27			1.48	0.11	Tip-Awned
Dyna-Gro 9932	2.26	2.84		1.47	0.11	Bearded
ARMOR SPIRIT	2.26	1.45		1.75	0.12	Bearded
GoWheat 2059	2.26	2.69	3.01	1.69	0.12	Awnless
DH12SRW056-058	2.26			1.41	0.10	Bearded
ARMOR VENOM	2.24	2.45		1.89	0.10	Bearded
Truman	2.24	2.75	3.18	1.15	0.10	Awnless
KAS Lincoln	2.21	2.78		1.36	0.10	Awnless
Pioneer variety 26R10	2.19	2.88	3.39	1.71	0.09	Bearded
AgriMAXX 495	2.17			1.56	0.11	Bearded
LOCAL LW 2848	2.16			1.49	0.11	Bearded
Dyna-Gro 9980	2.14			1.95	0.14	Bearded
PROGENY #BULLET	2.14	2.84	3.34	1.45	0.11	Bearded
AgriMAXX EXP 1902	2.11			1.86	0.12	Bearded
Pioneer variety 26R36	2.06	2.47	2.91	1.40	0.11	Bearded
Pioneer variety 26R45	1.93	2.40	2.92	1.35	0.08	Awnless
LOCAL LW 2937	1.85			1.72	0.12	Bearded
Average	2.51	2.91	3.35	1.66	0.12	
C.V.	16.00	15.99	15.80	18.86	22.5	
LSD (0.10)	0.67	0.52	0.46	0.52	0.05	

Table 42. Summary of Kentucky sudangrass yield trials 2008-2019 (yield shown as a percentage of the mean of the commercial varieties in the trial)

Variety	Proprietor/ KY Distributor	Lexington												Princeton			Mean ³ (#trials)		
		2008 ^{1,2}	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2017	2018	2019			
AS9301 BMR ⁴	Advanta Seeds/Ramer Seed					118													
AS9302 BMR (Brachytic Dwarf)	Advanta Seeds/Ramer Seed												124	104	102	119	117	115	114(6)
Enorma BMR	Cal/West Seeds			99	94	92	91	83	91	98									93(7)
FSG 1000 BMR	Farm Science Genetics									101	124	110							112(3)
Hayking BMR	Central Farm Supply	111	112	91	97	97	96	92	94	90	80	109				99			97(12)
Monarch V	Public	104	96	102	97	93	98	110	99	82									98(9)
Piper	Public	90	91	97	94	104	105	89	94	85	81	86	93	86	99	88			92(15)
ProMax BMR	Ampac Seed	95	101	110	115	96	103	100	111	111	106	102	101	96	84	87			101(15)
SS130 BMR	Cal/West Seeds			101	103		107	106	110	109	99		93						103(9)
Trudan Headless	S & W Seed Company							118							112			113	114(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.

⁴ BMR (brown midrib) means that a variety has been developed to produce lower amounts of lignin, which usually translates into higher quality.

Table 43. Summary of Kentucky sorghum-sudangrass yield trials 2008-2019 (yield shown as a percentage of the mean of the commercial varieties in the trial)

Variety	Proprietor/ KY Distributor	Lexington											Princeton			Mean ³ (#trials)			
		2008 ^{1,2}	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2017	2018		2019		
All trials are 1 year yields																			
AS6401 BMR	Advanta Seeds/Ramer Seed													84		112	98(2)		
AS6402 BMR ⁴ (Brachytic Dwarf)	AdvantaSeeds/Ramer Seed					91							78	82	67	98	98	91	86(7)
AS6503 BMR	Advanta Seeds/Ramer Seed							96	103	90									96(3)
AS6504 BMR (Dry Stalk)	Advanta Seeds/Ramer Seed												105	103		114	112		109(4)
Danny Boy II BMR	Dyna-Gro Seeds														117			110	114(2)
FSG 208 BMR	Farm Science Genetics			75															–
FSG 214 BMR	Farm Science Genetics							99	108	112						109	111		108(5)
FSG 215 BMR	Farm Science Genetics									112									–
Fullgraze II	Dyna-Gro Seeds														100			108	104(2)
Fullgraze II BMR	Dyna-Gro Seeds														97			106	102(2)
F75FS13	Dyna-Gro Seeds														94			76	85(92)
Greengrazer V	Farm Science Genetics			166				122	107	92	103	110							117(6)
GW300 BMR	Gayland Ward Seed				88	78	88	81	73	101	100	98				79			87(9)
HyGain	Turner Seed	104	105	118							110	127	117	121	130	108	121		116(10)
KFSugar-Pro55S	Byron Seed											110							–
MS 202 BMR	Farm Science Genetics			106															–
Nutra-King BMR	Gayland Ward Seed								110	108	96	113	118	108	114	105			109(8)
NutraPlus BMR	Public	106	97	94	103	106	109	106	96										102(8)
Sordan Headless	Chromatin									105									–
Special Effort	Public	109	110	93	94	115	120	91	111										105(8)
SS211	Southern States				104	93	114	103	118	111	121	118			109	87			108(10)
SS220 BMR	Southern States		107	84		112													101(3)
Sugar Graze II	Coffey Seed													110				110	110(2)
Surpass BMR	Turner Seed	81	80	64							79	84	75	75	88	97	74		80(10)
Super Sugar	Gayland Ward Seed				102	117	107		125	85						91			105(6)
Super Sugar BMR	Gayland Ward Seed									107									–
Super Sugar (Delayed Maturity)	Gayland Ward Seed							101	82		89	104			95	83			92(6)
Super Sugar Sterile	Gayland Ward Seed							94											–
Super Sweet 10	Dyna-Gro Seeds													121				118	120(2)
Sweet-For-Ever	Gayland Ward Seed				110	107	81												99(3)
Sweet-For-Ever BMR	Gayland Ward Seed					78	70		77	104	106	83			77	82			85(8)
SweetSix BMR	Gayland Ward Seed						93	101		91									95(3)
SweetSix BMR (Dry Stalk)	Gayland Ward Seed								102		72	107			103	108			98(5)
Vita-Cane	Gayland Ward Seed					121													–
Xtragraze BMR	Coffey Seed													79				70	75(2)

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.

⁴ BMR (brown midrib) means that a variety has been developed to produce lower amounts of lignin, which usually translates into higher quality.

Table 44. Summary of Kentucky pearl millet yield trials 2013-2019 (yield shown as a percentage of the mean of the commercial varieties in the trial)

Variety	Proprietor/ KY Distributor	Lexington							Princeton			Mean ³ (#trials)		
		2013 ^{1,2}	2014	2015	2016	2017	2018	2019	2017	2018	2019			
		All trials are 1 year yields												
Epic BMR	Coffey Seed									97			99	98(2)
Exceed BMR	Coffey Seed									89			102	96(2)
FSG 300 Hybrid	Farm Science Genetics			109	99	109					117			109(4)
FSG 315 BMR ⁴ (Dwarf)	Farm Science Genetics			101	102	81					97			95(4)
Leafy22 Hybrid	Turner Seed				105	124	108	108			115	100	116	111(7)
PearlMil	Dyna-Gro Seed									103			110	107(2)
Pennleaf Hybrid	Pennington Seed	93	91	94	96	87	98	100			84	93		93(9)
PP102M Hybrid	Cisco Seeds	93	93	90	79	90	91	97			77	104	95	91(10)
Prime360	Byron Seed									91			103	97(2)
SS1562M BMR	Southern States									103			95	99(2)
SS501	Southern States	90	99	96	86	94	94				89	96		93(8)
SS635	Southern States	108	112	101	116	94	110	108			107	115	105	108(10)
Sweet Summer	Cisco Seeds							86	95			85	104	93(4)
Tifleaf III Hybrid	Gayland Ward Seed	116	106	108	116	120	113	119			114	112	111	114(10)
Wonderleaf	Advanta Seed/Ramer Seed									98		100	107	102(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.

⁴ BMR (brown midrib) means that a variety has been developed to produce lower amounts of lignin, which usually translates into higher quality.

Table 45. Summary of Kentucky teff yield trials 2008-2019 (yield shown as a percentage of the mean of the commercial varieties in the trial)

Variety	Lexington										Princeton			Mean ³ (#trials)
	2008 ^{1,2}	2009	2010	2011	2012	2013	2014	2015	2016	2019	2008	2009	2019	
	All Trials are 1 year yields													
Corvallis	81	101	91	101	96	100	110	96	102	110	94	112	99	99(13)
CW0604										101			97	99(2)
Dessie	99	92	96	94	95	97	101	104	105	89	102	87	101	98(13)
Excaliber	109	104	125	108	106	103					109	111		109(8)
Highveld	100	121	106	101	109	103	102				111	115		108(9)
HorseCandi	99	105	89	108	94	97	80	104	82	86	91	84	103	94(13)
Moxie						94	96	105	107	110			95	101(6)
Pharaoh	105	85	106	106	97	101	93	97	94	102	95	101	107	99(13)
Rooiberg	112	109	113	108	115	102	88				102	107		106(9)
Summer Delight		91	96	88	93	100	119	101	104	91		90	99	97(11)
Tiffany	102	93	82	93	102	98	104	97	105	110	102	106	104	100(13)
VA T1 Brown		99	87	91	94	98	104	97	101	100		89		96(10)
Velvet		100	97	98	95	103	95	99	100	101		94	96	98(11)
Witkope	93	101	115	103	101	104	107				94	100		102(9)

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 46. Summary of Kentucky forage sorghum yield trials 2013-2019 (yield shown as a percentage of the mean of the commercial varieties in the trial)

Variety	Proprietor/ KY Distributor	Lexington						Princeton			Mean ³ (#trials)	
		2013 ^{1,2}	2014	2015	2016	2017	2018	2019	2017	2019 ⁴		2019
		All Trials are 1 year yields										
ADVF7232 BMR ⁵	Advanta Seed/Ramer Seed							88		93	84	86(2)
AF7201 BMR	Advanta Seed/Ramer Seed	89	81	101	89			94		74	83	90(6)
AF7203 BMR (Brachytic Dwarf)								48	70			59(2)
AF7401 BMR (Brachytic Dwarf)	Advanta Seed/Ramer Seed	76	94	90	83	86	72	85	116	87	100	89(9)
AF8301	Advanta Seed/Ramer Seed							98		124	85	92(2)
Ensilemaster	Caudill Seed	125	90	101	106	111	129	118	171	77	85	115(9)
FSG114 BMR	Farm Science Genetics		94	128	93	125	91	76	71	89	79	95(8)
FSG115 BMR (Brachytic Dwarf)	Farm Science Genetics		51	31	72	81	74	67	72	60	74	65(8)
F74FS23 BMR	Dyna-Gro Seed							125		77	76	101(92)
F74FS72 BMR	Dyna-Gro Seed							93		59	117	105(92)
F75FS13	Dyna-Gro Seed							107		109	84	96(2)
GW2120	Gayland Ward Seed	117	89	113	84	107	88	102	85	98	115	100(9)
GW400 BMR	Gayland Ward Seed	93	79	128	78	91	88	83	42			85(8)
GW475 BMR	Gayland Ward Seed						80	99				90(2)
GW600 BMR	Gayland Ward Seed		107	111	90		90	100				100(5)
KFFiber-Pro70FS	Byron Seed					65	53		70			63(3)
NK300	S&W SeedCompany		126	110	101	116	135	84	119			113(7)
SD1741 BMR	S&W SeedCompany		133	92	103	81	84	95	94			97(7)
SilageKing BMR (Dwarf)	Gayland Ward Seed		48									-
SiloPro BMR (Dwarf)	Gayland Ward Seed			24	74		63					54(3)
SP1615	S&W SeedCompany									164	170	-
SS1515	Southern States							125		97	75	100(2)
SS405	Chromatin		188	183	207	138	202	139	160	142	171	174(8)
Super Sile 20	Dyna-Gro Seed							107		106	124	116(2)
Super Sile 30	Dyna-Gro Seed							121		129	104	113(2)
TopTon	Dyna-Gro Seed							131		84	73	102(2)
XF7203 BMR (Brachytic Dwarf)	Advanta Seed/Ramer Seed					74	73					74(2)
1990	S&W SeedCompany		121	89	118	125	177	113	131			125(7)

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.

⁴ This trial was sprayed with an aphicide and the results are not included in the overall mean.

⁵ BMR (brown midrib) means that a variety has been developed to produce lower amounts of lignin, which usually translates into higher quality.

Table 47. Summary of Kentucky crabgrass yield trials 2016-2019 (yield shown as a percentage of the mean of the commercial varieties in the trial)

Variety	Proprietor/ KY Distributor	Lexington			Princeton	Mean ³ (#trials)
		2016 ^{1,2}	2018	2019	2019	
		All trials are 1 year yields				
Impact	Barenbrug USA	107	107	108	105	107(4)
Quick-N-Big	Noble foundation	89	85	81	99	89(4)
Red River	Noble foundation	104	108	110	96	105(4)

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 48. Summary of Kentucky spring oats yield trials 2015-2019 (planted mid March to early April; yield shown as a percentage of the mean of the commercial varieties in the trial)

Variety	Proprietor/Distributor	2015 ^{1,2}	2016	2017	2018	2019	Mean ³ (#trials)
		All trials are 1 year yields					
CCSO-102	Caldbeck Consulting				95	102	99(2)
CCSO-120 (black hulled)	Caldbeck Consulting				106	106	106(2)
Common	Central Farm Supply	89					
Excel	Ag. Alumni Seed, IN	120	101	111	107	115	111(5)
Haywire	Cisco Seeds					81	
Jerry	Caudill Seed	107	93	103	99	95	99(5)
Persik (black hulled)	Caldbeck Consulting		112	114	127	106	115(4)
PST-241	Caldbeck Consulting	91	86	86	86		87(4)
PST5O200	Caldbeck Consulting	102	90	87	79		90(4)
PST5O-288C	Caldbeck Consulting	91	102	88	97		95(4)
Reins	Ag. Alumni Seed, IN	94			102		98(2)
Robust	Ag. Alumni Seed, IN	104	111	117	102	94	106(5)
Saber	Ag. Alumni Seed, IN	104			100	97	100(3)
VNK	Public		97	107	101	94	100(4)
021A17815	Ag. Alumni Seed, IN	97	108	87			97(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.



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