Final Report
UC-ANR
2016 Field Research on Sorghum Forages for the California Dairy Industry

Jeff Dahlberg[1], Bob Hutmacher[2], Steve Wright,[3] Dan Putnam[4], Nicholas George[5], Nick Clark[6], Jennifer Heguy[7], Deanne Meyer[8], Peter Robinson[9], Joy Hollingsworth[1], and Julie Sievert[1]

Introduction

The San Joaquin Valley of California is home to a multi-billion dollar dairy industry. Continuing winter droughts and poor water allocations have spurred renewed interest in forage sorghums as an option in silage pits within the dairy industry. It was estimated that between 70-90,000 acres of forage sorghum were planted in the state in 2016. Sorghum is known for its inherent drought tolerance and this was the sixth year of sorghum forage and sudangrass trials planted at the Kearney Agricultural Research and Extension (KARE) Center and the Westside Research and Extension (WREC) Center to evaluate commercially available sorghum forages. This year additional trials were added with a second planting at KARE and an additional site planted at the UC Davis Research Farm (UC Davis). This year also saw the first reported cases of Sugarcane Aphid (SCA) in California (http://cekern.ucanr.edu/files/247779.pdf). SCA has been an issue in primarily grain and some forage fields in various sorghum growing states. Research nationwide has been undertaken to evaluate the potential impact of SCA on yield in both grain and forage sorghum production (see http://sorghum.ucanr.edu/news/index.html and http://www.sorghumcheckoff.com/newsroom/2016/03/28/sugarcane-aphid/). Several forage fields in California saw heavy infestation of SCA and silage samples have been collected to evaluate the impact on silage quality. Insecticide options are also being explored as we begin to understand control options to limit the impact of this insect on both production and quality in California.

Methods and Materials

Eight seed companies provided a total of 39 hybrids, which included traditional forage sorghums, Photoperiod sensitive (PS) forage sorghums, and brown mid-rib (BMR) derivatives of both traditional and PS sorghums. This year, some millet hybrids were also included. Hybrids were planted in a randomized block design in four row plots planted on 30-inch raised beds and were analyzed as a split-plot design. Irrigation was applied using furrow irrigation at Kearney and a combination of overhead sprinklers and flood irrigation at the Westside Center and at the

[1] Director, Kearney Agricultural Research and Extension Center, 9240 S. Riverbend Ave., Parlier, CA 93648, phone: 559-646-6060, Email: jadahlberg@ucDavis.edu
[2] Director, University of California Westside Research and Extension Center, PO Box 158, Five Points, CA 93624, phone: 559-884-2412, Email: rbhutmacher@ucDavis.edu
[3] Farm Advisor (retired), University of California Coop. Extension, Tulare & Kings Counties, 4437 S. Laspina Street, Suite B, Tulare, CA 93274, phone: 559-280-7811; Email: sdwright@ucDavis.edu
[4] Alfalfa & Forage Extension Specialist, Dept. of Agronomy & Range Science, UC-Davis, 2240 PES, One Shields Ave., Davis, CA 95616, phone: 530-752-8982; Email: dhputnam@ucDavis.edu
[5] Ass. Project Scientist, Dept. of Plant Science, UC-Davis, One Shields Ave., Davis, CA 95616, phone: 530-752-1703; Email: nicgeorgeclark@ucDavis.edu
[6] Farm Advisor, UCCE Kings County, 680 Campus Drive, Suite A, Hanford, CA 93230, phone: 559-852-2788; Email: neclark@ucanr.edu
[7] Farm Advisor, UCCE San Joaquin County, 3800 Cornucopia Way, Suite A, Modesto, CA 95358, phone: 209-525-6800; Email: jmheguy@ucanr.edu
[8] Livestock Waste Management Specialist, Dept. Animal Science, One Shields Ave., UC-Davis, Davis, CA 95616, phone: 530-752-9391; Email: dmeyer@ucDavis.edu
[9] Dairy Nutrition & Management Specialist, Dept. Animal Science, One Shields Ave., UC-Davis, Davis, CA 95616, phone: 530-754-0175; Email: phrobinson@ucDavis.edu

Davis Farm. Fertility applications followed similar recommendation for forage sorghums for the region. The 2016 growing season was characterized by little winter precipitation and poor soil moisture reserves throughout the growing season. Trials at Kearney, Westside and Davis were irrigated as needed and according to ET demands of the crop at the various locations. The first planting at KARE received a preplant irrigation of 2.96 inches on April 25, 2016 and a total of 20.04 inches of applied irrigation. The second planting at KARE received a preplant irrigation of 4.89 inches on May 23, 2016 and a total of 19.26 inches of applied irrigation. Rainfall totals from January through May 4, 2016 prior to the first planting at KARE were 6.49 inches, while the second planting had a total of 7.07 inches of rain prior to planting. Rainfall totals of 0.61 and 0.05 inches were recorded throughout the growing season for the two planting dates, respectively.

Rainfall totals from January through June prior to planting at WREC were 5.33 inches, while 0.01 inches of rainfall were recorded throughout the growing season. At WREC, seed was planted into dry soil and then irrigated using a total of 2.75 inches delivered between June 3 and June 10 using sprinklers to ensure good stand establishment. Total irrigation applications of 24.96 inches were recorded for the full growing season. Rainfall totals from January to May at UC Davis were 11.00 inches, while 0.76 inches fell throughout the growing season. A total of 31.71 inches of irrigation were applied for the full growing season.

Trials were harvested approximately 100 days after planting.

Other cultural practices and study information are listed below:

Trial Location:	KARE Planting 1 and 2, Parlier
Cooperator:	UC-ANR
Previous Crop:	Winter forage (Oats)
Soil Type:	Hanford sandy loam
Plot Size:	Four, 30 inch rows by 20 ft
Replications:	3
Study Design:	Split-Plot
Planting Date:	May 4 and 31, 2016
Planting Rate:	100,000 seed $acre^{-1}$
Seed Method:	Almaco 4 row plot planter
Fertilizer:	Ammonium sulfate at 250 lbs $acre^{-1}$ providing 52 units of N
Herbicide:	Dual Magnum at 1.3 pints per ac^{-1} as a pre-plant
Irrigation:	See narrative above
Silage Harvest Date:	Plots harvested with Wintersteiger Cibus S forage chopper on August 8 and September 15, 2016

Trial Location:	Westside Research and Extension Center, Five Points
Cooperator:	UC-ANR Extension
Previous Crop:	Winter forage (wheat grown for silage-not taken to grain)
Soil Type:	Panoche clay loam
Plot Size:	Four, 30 inch rows by 20 ft
Replications:	3
Study Design:	Split-Plot
Planting Date:	June 3, 2016
Planting Rate:	100,000 seed $acre^{-1}$
Seed Method:	Almaco 4 row plot planter
Fertilizer:	200 lbs $acre^{-1}$ N-P-K 11-52-00 on May 2 and 100 lbs $acre^{-1}$ N on June 17
Herbicide:	Dual Magnum at 24 oz ac^{-1} as a pre-plant on May 3; Clarity 8oz on June 24 and Prowl-H_20 as layby at 24 oz ac^{-1} on June 28
Irrigation:	Sprinklers for pre-irrigation and stand establishment, gated pipe furrow irrigation subsequent irrigations – see narrative for amounts
Silage Harvest Date:	Plots harvested with Wintersteiger Cibus S forage chopper on September 20, 2016

Trial Location:	UC Davis Research Station, Davis
Cooperator:	UC-ANR
Previous Crop:	Small grains cover crop
Soil Type:	Reiff very fine sandy
Plot Size:	Four, 30 inch rows by 20 ft
Replications:	3
Study Design:	Split-Plot
Planting Date:	May 12, 2016
Planting Rate:	100,000 seed $acre^{-1}$
Seed Method:	Wintersteiger Self Propelled Drill Planter
Fertilizer:	20 gallons per acre 8-24-6 pre-plant fertilizer, 100 units N as 32-0-0 side dress June 20
Herbicide:	
Irrigation:	See above narrative
Silage Harvest Date:	Plots harvested with Wintersteiger Cibus S forage chopper September 14, 2016

Data Collected:

1. Plant stands
2. Plant height (ft) at silage harvest
3. Lodging at silage harvest. Percent of fallen or significantly leaning plants per plot.
4. Moisture Content at Harvest.
5. Forage (silage) yield. The middle two rows of each plot were harvested with a Wintersteiger Cibus S forage chopper. Yields are reported at 65% moisture in tons/acre.

6. Nutrient analysis: Samples were collected from the forage chopper in the field, weighed and then placed in forced air Gruenberg oven (Model T35HV216, Williamsport, PA) at 50º C until dried. These sub-samples were sent to Dairyland Laboratory, Inc, Arcadia, WI for analysis.
7. Key Nutrient Analysis Definitions
    a. Crude Protein: 6.25 times % total nitrogen
    b. ADF: % Acid Detergent Fiber; constituent of the cell wall includes cellulose and lignin; inversely related to energy availability
    c. NDF: Neutral Detergent Fiber; cell wall fraction of the forage
    d. Lignin: percent estimated lignin present
    e. Starch: estimated starch content
    f. Fat: estimated fat content
    g. NDFd30: neutral detergent fiber digestibility over 30 hours
    h. NDFd240: neutral detergent fiber digestibility over 240 hours
    i. RFV: Relative Feed Value is an index for comparing forages based on digestibility and intake potential. RFV is calculated from ADF and NDF. An RFV of 100 is considered the average score and represents alfalfa hay containing 41% ADF and 53% NDF on a dry matter digestibility.
    j. RFQ: Relative Feed Quality is an index for comparing forages calculated from TDN and DMI. An RFQ of 100 is considered the average score and represents fully mature alfalfa.
    k. Milk lbs/ton: A projection of potential milk yield per ton for forage dry matter.

Data was analyzed using the SAS statistical package.

Results

A summary of yield, agronomic traits and nutritional analyses are reported by types of forage sorghums and millet grown in the all locations in Table 1. See Tables 2 and 3 for a comparison of the different hybrids agronomic, yield, and nutritional characteristics.

Table 1. Summary of key forage characteristics by type of forage grown at four locations, Kearney (2 planting dates), Westside, and Davis in 2016.

Sorghum Type[1]	% Lodging @ Harvest[2]	Tons/ac @65% Moist.[2]	% Crude Protein[2]	% ADF[2]	% NDF[2]	WT Acre in water[2]	% Lignin[2]	% NDF D30[2]	% NDF D240[2]	Milk lbs/ton DM[2]	Relative Feed Quality (RFQ)[2]
BMR (16)	22.29 c	21.04 bc	7.23 b	37.2 c	55.8 cd	0.888 bc	4.78 c	52.7 a	70.9 a	2544.5 a	106.90 a
NonBMR (15)	23.86 c	21.17 bc	6.86 bc	36.8 c	53.8 d	0.89 bc	5.31 b	44.3 b	63.5 bc	2487.6 a	95.99 ab
PS (2)	21.04 c	25.35 a	6.18 c	45.8 a	66.2 a	1.08 a	6.21 a	42.4 bc	66.7 b	1793.4 c	61.45 d
SGBMR (2)	69.38 a	17.87 c	7.60 b	37.2 c	53.3 d	0.770 c	5.24 b	44.8 b	63.8 bc	2547.1 a	96.51 ab
SGNonBMR (1)	20.00 c	24.05 ab	6.18 c	40.9 b	59.1 bc	1.03 ab	6.14 a	40.1 c	62.4 c	2154.8 b	71.56 cd
SGPSBMR (1)	42.92 b	21.00 bc	6.24 c	41.1 b	61.2 b	0.893 bc	5.35 b	50.7 a	70.5 a	2318.1 ab	87.29 bc
Millet (1)	1.00 d	13.19 d	9.07 a	39.2 bc	60.4 b	0.608 d	5.19 bc	52.3 a	71.0 a	2182.3 b	95.18 ab
Trial Avg.	25.35	21.12	7.02	37.75	55.71	0.892	5.15	47.98	67.13	2459.9	97.93

[1]Number in parenthesis is the number of hybrids in each sorghum type. BMR = brown midrib; PS = Photoperiod sensitive; SG = Sudangrass.
[2]Means followed by the same letter do not significantly differ using LSD (P=0.01)

Lodging at the second KARE planting and at the UC Davis were significantly different from WREC and the first planting at KARE, with the lowest lodging % occurring at the first planting of the KARE trial. The first planting at KARE took place the first week of May and this may be the optimum time to plant forage sorghums to reduce lodging issues that can happen under ideal, hot growing conditions here in the valley. UC Davis and WREC produce significantly higher forage yields than either planting at KARE. This was the first year that we have report yield based on the amount of irrigation applied and expressed as ton per acre inch of water. Based on this, sorghum ranged from a high of 1.33 tons to a low of 0.63 tons per acre inch of water applied. These may be valuable data points in the discussion of more efficient crops that could be used in the dairy industry to optimize silage yields with limited water availability.

Forage yields for the trials ranged from a high of 38.1 to 13.2 tons acre^{-1} with an average of 21.12 tons acre^{-1} (see Tables 1 and 2). Highest yields were 7.12 tons acre^{-1} higher than the average yields of 2015 and 2.30 tons more than 2014. Increased yields could be attributed to adding additional sites and better water management at the sites, though both Kearney and Westside experienced continued drought conditions throughout the winter of 2015-16. The non-BMR PS forages were slightly more productive than their BMR counterparts, similar to findings from previous years (Table 1). Planting at Davis consistently yielded significantly higher tons acre^{-1} in production, while the earlier planting at Kearney saw significantly less lodging than the other sites (Table 2). The increased yields at Davis could be attributed to greater soil moisture during the winter and less water stress over the growing season. The earlier plantings at Kearney did not grow as quickly or robustly as the other sites, which could have had an impact on sorghum's growth patterns which would favor shorter plants and sturdier stalk strength.

Similar to previous reports, lodging can be a major issue for forage sorghums. Lodging ranged from 0.8 to 82.9% (Table 2). The non-BMR sorghums lodged the least of the different forage types, but even some of these forages had lodging issues. This year, the BMR forages had lower lodging issues than in previous years and this could reflect improved genetics in the hybrids being tested and/or the removal of forages that lodged in past trials. Different management schemes are still needed to reduce lodging to optimize production. Planting studies and population work will be important in determining the correct stands for forage sorghums to reduce lodging issues. Like last year, little stem breakage was observed in the plots, rather the plants tended to bend over from the base of the stem. Better irrigation control (not over-irrigating), better control of nitrogen applications, and throwing dirt up around the stems to support brace root development may be required to reduce the percentage of lodging in future research trials.

Digestibility as measured by ADF, NDF, 30 and 240 hours NDFd, and overall forage quality as predicted by lbs of milk per dry ton and relative forage quality was significantly highest in the BMR sorghums (Table 1), though there were some excellent non-BMR forages as well (Table 3). Photoperiod sensitive forage sorghum, though high yielding, were relatively poor nutritionally. Nutritional information is important for establishing the baseline nutrition of the silage and is key to understanding the proper formulation of the feed for adequate nutrition for the dairy animal.

The top hybrids were ranked in this study by taking those hybrids with the greatest yields and eliminating those hybrids that lodged by more than 10% (Table 4). Of these hybrids, yield ranged from a low of 18.2 tons acre^{-1} with Scott Seed 50632X to a high of 23.6 tons acre^{-1} with Scott Seed Great Scott BMR R.

For many producers, yield is the greatest factor in their selection of sorghum forages. Table 5 highlights the top yielding hybrids that produced more than 20.0 tons acre^{-1} of yield. The highest yielding forage sorghum was SP 1880 from Chromatin/Sorghum Partners, LLC at 31.8 tons acre^{-1} followed by Richardson Seeds Sweeter N Honey II at 27.2 tons acre^{-1}. As in past years, lodging was associated with some of the highest yielding forage sorghums.

Discussion

This was the sixth year that a wide range of forage sorghums (39), both commercial and experimental, were evaluated for both yield and quality parameters in large replicated trials in three locations in California. Drought throughout the state has caused severe water restrictions in many areas within the San Joaquin Valley and this continues to impacted yields. Work is continuing to evaluate management strategies to minimize lodging issues, optimize irrigation levels and management of fertilizer applications. Given the limited amount of irrigation used in these studies, low inputs and high yields, the potential does exist in sorghum forages to save both water and fertilizer, both costly inputs in the production of forages in the state. Forage selection should be a combination of factors that optimize quality, yield and standability (lodging resistance) and will require additional management of feed rations to optimize the potential of these forage crops to supplement the feeding needs of dairies in the state.

Table 2. 2016 comparisons of sorghum forage hybrids and locations for agronomic characteristics and yield at KARE, WREC, and UC Davis by seed company.

Hybrid Information					Agronomic Measurements				
Hybrid	**Company**	**Type**	**Maturity**	**BMR**	**% Lodging**	**Height (cm)**	**Ton ac^{-1} 65% Moist**	**ton per acre inch water**	**SCA rating**
BDX204	Ceres	F	E	N	29.6 g-m	284.6 e-i	20.1 e-m	0.827 h-l	1.5 a-d
BDX206	Ceres	F	E	N	50.0 b-e	315.0 b	18.5 j-m	0.796 j-l	1.7 ab
BDX207	Ceres	F	E	N	8.8 n-q	245.3lm	21.5 d-k	0.883 f-k	1.2 d-f
Silo 700D-BMR	Richardson Seeds	F	L	Y	13.3 m-q	199.6 o	22.9 c-h	0.960 d-i	1.3 b-f
Silo 700D	Richardson Seeds	F	L	N	16.7 k-q	193.4 o-q	24.1 b-e	1.023 c-f	1.1 ef
Sweeter N Honey II	Richardson Seeds	F	L	N	32.9 f-k	300.0 b-e	27.2 b	1.136 bc	1.0 f
Sweeter N Honey BMR	Richardson Seeds	F	ME	Y	20.0 j-p	230.6 mn	19.5 h-m	0.806 i-l	1.5 a-d
Bundle King BMR	Richardson Seeds	F	L	Y	57.5 bc	283.8 f-i	16.5 m-o	0.714 l-n	1.3 c-f
RS1X	Richardson Seeds	F	ME	N	1.7 q	174.1 r	21.6 d-k	0.914 d-j	1.3 b-f
RS2X	Richardson Seeds	F	ME	N	0.8 q	153.5 s	18.3 j-m	0.789 j-l	1.2 d-f
AF 7102	Alta (Advanta)	F	E	Y	42.1 c-h	215.6 n	17.9 k-n	0.769 j-m	1.4 a-e
AF 8301	Alta (Advanta)	F	M	N	34.6 e-j	193.4 o-q	25.7 bc	1.065 b-d	1.6 a-c
AF 7401	Alta (Advanta)	F	L	Y	3.3 q	181.8 p-r	19.8 f-m	0.847 g-l	1.1 ef
SP1880	Chromatin/Sorghum Partners	F	L	N	30.4 g-l	338.6 a	31.8 a	1.327 a	1.4 a-e
SP1615	Chromatin/Sorghum Partners	F	PS	N	27.1 g-m	310.8 bc	27.1 b	1.187 ab	1.7 a
NK 300	Chromatin/Sorghum Partners	F	ME	N	26.3 h-m	180.5 qr	22.0 d-j	0.909 e-j	1.4 a-f
SP 3902	Chromatin/Sorghum Partners	F	L	Y	7.5 o-q	196.3 o-q	20.8 d-l	0.872 f-k	1.4 a-f
SP 3903	Chromatin/Sorghum Partners	F	ML	Y	3.3 q	181.4 qr	21.8 d-k	0.920 d-j	1.3 c-f
SP 2774	Chromatin/Sorghum Partners	F	M	Y	20.4 j-o	278.2 hi	22.6 d-i	0.958 d-i	1.3 b-f
SP2876	Chromatin/Sorghum Partners	F	M	Y	31.7 f-k	281.8 g-i	25.12 b-d	1.042 b-e	1.5 a-d
Great Scott BMR R	Scott Seed	F	L	Y	9.6 n-q	176.0 r	23.6 b-g	0.976 d-h	1.3 c-f
Great Scott BMR W	Scott Seed	F	L	Y	5.8 o-q	199.1 o	19.4 h-m	0.822 h-l	1.4 a-e

Table 2. continued.

Hybrid Information					Agronomic Measurements				
Hybrid	**Company**	**Type**	**Maturity**	**BMR**	**% Lodging**	**Height (cm)**	**Ton ac^{-1} 65% Moist**	**ton per acre inch water**	**SCA rating**
Premium Stock LS	Scott Seed	F	PS	N	15.0 l-q	270.5 i-k	23.7 b-f	0.988 c-g	1.1 ef
50315X	Scott Seed	F	M	N	3.8 pq	155.5 s	19.8 f-m	0.833 h-l	1.1 ef
50632X	Scott Seed	F	M	Y	5.8 o-q	136.0 t	18.2 j-m	0.766 j-m	1.2 d-f
849F	Pioneer	F	ML	N	56.3 bc	258.6 kl	21.9 d-j	0.890 e-k	1.4 a-e
841F	Pioneer	F	L	N	9.2 n-q	197.3 op	21.0 d-l	0.880 f-k	1.5 a-d
Silo Milo Plus	Lockwood Seed & Grain	F	L	N	4.6 o-q	182.0 p-r	20.8 e-l	0.874 f-k	1.1 ef
GW 600	Gayland Ward Seed	F	M	Y	47.1 b-f	271.7 i-k	18.7 i-m	0.799 j-l	1.3 b-f
Silo Pro	Gayland Ward Seed	F	L	Y	4.6 o-q	195.4 o-q	19.6 g-m	0.836 g-l	1.7 ab
GW 400	Gayland Ward Seed	F	ME	Y	54.2 b-d	289.6 d-h	18.7 i-m	0.7944 j-l	1.3 b-f
EX 10216	Gayland Ward Seed	F	?	?	37.9 d-i	273.3 i-k	17.1 l-o	0.740 k-n	1.6 a-c
EX 10217	Gayland Ward Seed	F	ME	N	58.8 b	298.1 c-f	14.0 no	0.630 mn	1.3 c-f
GW 2120	Gayland Ward Seed	F	M	N	24.2 i-n	261.6 jk	21.2 d-k	0.893 e-k	1.5 a-d
Sweetsix	Gayland Ward Seed	SG	ME	Y	55.8 bc	296.1 c-g	19.5 h-m	0.825 h-l	1.1 ef
Nutra King	Gayland Ward Seed	SG	ME	Y	82.9 a	276.2 h-j	16.2 m-o	0.716 l-n	1.3 c-f
Supersugar-2	Gayland Ward Seed	SG	L	N	20.0 j-p	301.2 b-d	24.1 b-e	1.026 c-f	1.2 d-f

Table 2. continued.

Hybrid Information					Agronomic Measurements				
Hybrid	**Company**	**Type**	**Maturity**	**BMR**	**% Lodging**	**Height (cm)**	**Ton ac^{-1} 65% Moist**	**ton per acre inch water**	**SCA rating**
Sweetforever	Gayland Ward Seed	SG	PS	Y	42.9 b-g	302.3 b-d	21.0 e-l	0.893 e-k	1.2 d-f
Tifleaf III	Gayland Ward Seed	Millet	ME	N	1.0 q	192.1 o-q	13.2 o	0.608 n	1.0 f
Means					**25.35**	**236.04**	**21.12**	**0.892**	**1.31**
CV					**79.08**	**8.07**	**23.21**	**20.77**	**34.59**
Location									
KARE1					**2.24 c**	**192.7 c**	**16.16 d**	**0.81 c**	**1.00 b**
KARE2					**40.35 a**	**245.6 b**	**20.25 c**	**1.05 a**	**2.23 a**
WREC					**21.33 b**	**253.9 a**	**22.56 b**	**0.90 b**	**1.00 b**
UC Davis					**37.57 a**	**254.1 a**	**25.42 a**	**0.80 c**	**1.00 b**

[1]Hybrid information provided by seed companies. SG=Sudangrass, F=Forage sorghum, E=Early, ME=Medium Early, M=Medium, ML=Medium Late, L=Late, PS=Photoperiod Sensitive.

[2]Means followed by the same letter do not significantly differ using LSD (P=0.01)

Table 3. 2016 comparisons of sorghum forage hybrids and locations for nutrient composition and calculations at at KARE, WREC, and UC Davis by seed company.

Hybrid Information[1]					Nutrient Composition & Calculations[2]					
Hybrid	**Company**	**Type**	**Maturity**	**BMR**	**% Crude Protein**	**% ADF**	**% NDF**	**% Lignin**	**% Starch**	**% Fat**
BDX204	Ceres	F	E	N	6.3 j-n	36.4 m-r	55.0 j-o	5.3 d-g	10.4 g-k	2.2 d-i
BDX206	Ceres	F	E	N	5.9 no	38.9 e-l	58.6 e-j	5.3 d-g	7.5 k-n	2.0 j-m
BDX207	Ceres	F	E	N	7.1 d-i	41.6 cd	62.2 b-e	5.1 d-j	4.4 n-p	2.1 h-l
Silo 700D-BMR	Richardson Seeds	F	L	Y	7.3 c-h	35.8 o-t	54.5 k-o	4.9 f-m	13.9 ef	2.2 d-i
Silo 700D	Richardson Seeds	F	L	N	7.0 f-k	33.1 vw	47.8 rs	5.0 e-l	21.8 ab	2.3 b-f
Sweeter N Honey II	Richardson Seeds	F	L	N	6.5 i-n	40.9 c-g	59.0 d-i	6.3 a	9.7 g-k	1.8 m-p
Sweeter N Honey BMR	Richardson Seeds	F	ME	Y	6.9 f-l	36.4 m-r	54.2 k-p	4.2 p	12.6 e-h	2.4 b-e
Bundle King BMR	Richardson Seeds	F	L	Y	6.1 m-o	40.9 c-h	62.6 b-d	4.6 l-p	4.8 n-p	1.9 k-n
RS1X	Richardson Seeds	F	ME	N	7.1 d-i	36.2 n-t	51.5 o-q	5.2 d-j	18.7 b-d	2.1 f-j
RS2X	Richardson Seeds	F	ME	N	8.0 bc	33.9 s-w	48.3 q-s	5.3 d-g	21.8 ab	2.2 f-j
AF 7102	Alta (Advanta)	F	E	Y	7.4 c-g	32.4 w	46.7 s	4.4 n-p	21.0 bc	2.7 a
AF 8301	Alta (Advanta)	F	M	N	7.1 e-j	32.2 w	46.2 s	5.2 d-i	25.2 a	2.2 c-h
AF 7401	Alta (Advanta)	F	L	Y	8.7 ab	38.6 h-n	57.8 f-k	4.9 f-m	9.5 h-k	2.2 e-j
SP1880	Chromatin/Sorghum Partners	F	L	N	5.4 o	44.6 ab	64.9 ab	6.5 a	5.3 m-p	1.7 pq
SP1615	Chromatin/Sorghum Partners	F	PS	N	5.8 no	46.5 a	66.9 a	6.0 a	3.9 op	1.5 q
NK 300	Chromatin/Sorghum Partners	F	ME	N	6.6 h-n	33.9 t-w	48.6 q-s	5.0 e-l	21.8 ab	2.3 b-f
SP 3902	Chromatin/Sorghum Partners	F	L	Y	7.5 c-f	34.3 q-w	53.0 m-p	4.2 op	12.9 e-g	2.5 b
SP 3903	Chromatin/Sorghum Partners	F	ML	Y	7.4 c-h	37.8 i-o	56.6 i-m	4.6 l-o	11.3 f-j	2.2 c-h
SP 2774	Chromatin/Sorghum Partners	F	M	Y	6.2 l-n	38.3 i-n	56.8 h-l	4.8 i-n	10.3 g-k	2.0 i-m
SP2876	Chromatin/Sorghum Partners	F	M	Y	6.3 j-n	37.4 j-p	56.1 i-n	4.9 g-m	11.5 f-j	2.1 f-j
Great Scott BMR R	Scott Seed	F	L	Y	7.7 c-f	36.6 l-q	55.9 i-n	4.5 m-p	12.8 e-h	2.3 b-g
Great Scott BMR W	Scott Seed	F	L	Y	7.7 c-f	36.3 m-s	54.7 k-o	4.6 l-o	11.5 f-g	2.4 b-d

Table 3. continued.

Hybrid Information[1]					Nutrient Composition & Calculations[2]					
Hybrid	**Company**	**Type**	**Maturity**	**BMR**	**% Crude Protein**	**% ADF**	**% NDF**	**% Lignin**	**% Starch**	**% Fat**
Premium Stock LS	Scott Seed	F	PS	N	6.5 i-n	45.1 ab	65.4 ab	6.1 ab	2.5 p	1.7 o-q
50315X	Scott Seed	F	M	N	7.2 c-i	35.7 o-u	51.4 o-r	5.1 d-k	19.2 bc	2.2 f-j
50632X	Scott Seed	F	M	Y	9.2 a	33.4 u-w	48.6 q-s	4.8 j-n	20.6 bc	2.3 b-f
849F	Pioneer	F	ML	N	6.5 i-n	35.2 p-v	50.6 p-q	5.5 cd	18.1 cd	2.1 f-j
841F	Pioneer	F	L	N	7.7 c-f	43.1 bc	63.6 a-c	5.8 bc	5.3 m-p	1.7 n-q
Silo Milo Plus	Lockwood Seed & Grain	F	L	N	7.3 c-h	34.2 r-w	48.8 q-s	4.8 i-n	20.9 bc	2.3 b-g
GW 600	Gayland Ward Seed	F	M	Y	7.3 c-i	38.6 g-m	57.2 g-l	4.9 h-m	8.7 j-m	2.2 f-j
Silo Pro	Gayland Ward Seed	F	L	Y	8.0 cd	35.9 o-t	54.4 k-o	4.8 i-n	12.0 f-j	2.4 bc
GW 400	Gayland Ward Seed	F	ME	Y	6.7 g-m	38.6 f-m	58.9 e-i	4.7 k-o	6.0 l-o	2.3 c-g
EX 10216	Gayland Ward Seed	F	?	?	7.1 e-j	39.0 e-k	57.7 f-k	4.6 l-p	5.9 l-p	2.3 c-h
EX 10217	Gayland Ward Seed	F	ME	N	6.0 m-o	39.9 d-i	60.7 c-g	5.3 d-g	4.8 n-p	2.1 g-j
GW 2120	Gayland Ward Seed	F	M	N	6.7 g-m	36.8 k-p	53.8 l-p	5.4 de	12.2 e-i	2.2 d-i
Sweetsix	Gayland Ward Seed	SG	ME	Y	7.3 c-h	37.5 j-o	53.7 l-p	5.2 d-i	14.0 ef	2.3 b-f
Nutra King	Gayland Ward Seed	SG	ME	Y	7.9 c-e	36.8 k-p	52.7 n-p	5.3 d-h	15.5 de	2.3 b-g
Supersugar-2	Gayland Ward Seed	SG	L	N	6.2 k-n	40.9 c-f	59.1 d-i	6.1 ab	8.9 i-l	1.9 l-o
Sweetforever	Gayland Ward Seed	SG	PS	Y	6.2 k-n	41.1 c-e	61.2 c-f	5.3 d-f	5.7 l-p	1.9 m-p
Tifleaf III	Gayland Ward Seed	Millet	ME	N	9.1 a	39.2 e-j	60.4 c-h	5.3 d-j	7.6 k-n	2.1 g-j
Means					**7.02**	**37.75**	**55.71**	**5.15**	**12.29**	**2.14**
CV					**13.95**	**7.76**	**8.24**	**10.44**	**34.77**	**11.55**
Location										
KARE1					**7.31 a**	**40.63 a**	**61.63 a**	**5.76 a**	**5.49 d**	**1.96 c**
KARE2					**7.22 a**	**37.58 b**	**55.97 b**	**4.89 c**	**11.32 c**	**2.13 b**
WREC					**7.15 a**	**38.00b**	**55.10 b**	**5.35 b**	**12.49 b**	**2.15 b**
UC Davis					**6.40 b**	**34.83 c**	**50.23 c**	**4.61 d**	**19.77 a**	**2.31 a**

Table 3. continued.

Hybrid Information[1]					Nutrient Composition & Calculations[2]					
Hybrid	**Company**	**Type**	**Maturity**	**BMR**	**30 hr NDFd**	**240 hr NDFd**	**ASH**	**CA**	**P**	**MG**
BDX204	Ceres	F	E	N	47.9 g-j	65.6 g-i	10.08 k-n	0.289 g-l	0.186 o-q	0.200 e-i
BDX206	Ceres	F	E	N	46.1 i-l	66.0 gh	11.72 e-i	0.309 d-j	0.176 qr	0.208 c-h
BDX207	Ceres	F	E	N	50.0 f-h	72.1 b-d	13.36 a-c	0.358 b-d	0.214 j-m	0.224 b-d
Silo 700D-BMR	Richardson Seeds	F	L	Y	54.6 bc	71.0 c-e	11.02 g-m	0.307 d-k	0.230 g-j	0.228 bc
Silo 700D	Richardson Seeds	F	L	N	42.4 m-o	59.9 lm	11.01 g-m	0.264 h-m	0.253 b-f	0.186 i-l
Sweeter N Honey II	Richardson Seeds	F	L	N	39.3 pq	61.9 kl	11.00 g-m	0.314 d-j	0.203 l-o	0.213 b-f
Sweeter N Honey BMR	Richardson Seeds	F	ME	Y	58.1 a	71.6 b-e	11.80 d-i	0.334 c-g	0.216 j-l	0.209 b-g
Bundle King BMR	Richardson Seeds	F	L	Y	58.9 a	76.5 a	11.57 e-j	0.324 d-h	0.183 p-r	0.230 b
RS1X	Richardson Seeds	F	ME	N	43.6 l-n	64.3 h-j	11.51 e-j	0.227 m	0.261 bc	0.166 lm
RS2X	Richardson Seeds	F	ME	N	44.0 l-n	62.9 jk	10.89 h-m	0.253 j-m	0.271 b	0.177 j-l
AF 7102	Alta (Advanta)	F	E	Y	47.0 h-k	65.4 g-j	12.08 c-i	0.316 d-i	0.253 b-f	0.183 i-l
AF 8301	Alta (Advanta)	F	M	N	40.6 o-q	56.7 n	9.23 n	0.233 lm	0.246 c-h	0.182 i-l
AF 7401	Alta (Advanta)	F	L	Y	53.0 b-d	74.2 ab	13.52 ab	0.402 ab	0.259 b-d	0.227 bc
SP1880	Chromatin/Sorghum Partners	F	L	N	40.7 o-q	63.1 i-k	10.02 l-n	0.276 g-m	0.167 r	0.193 f-k
SP1615	Chromatin/Sorghum Partners	F	PS	N	42.1 no	65.3 g-j	11.64 e-j	0.293 f-l	0.195 n-p	0.199 e-i
NK 300	Chromatin/Sorghum Partners	F	ME	N	42.0 n-p	59.1 mn	10.29 j-n	0.261 i-m	0.240 e-i	0.184 i-l
SP 3902	Chromatin/Sorghum Partners	F	L	Y	55.2 b	70.7 c-f	11.59 e-j	0.335 c-g	0.236 f-i	0.198 e-j
SP 3903	Chromatin/Sorghum Partners	F	ML	Y	53.7 bc	72.4 b-d	12.23 b-h	0.333 c-g	0.238 e-i	0.201 e-i
SP 2774	Chromatin/Sorghum Partners	F	M	Y	54.3 bc	71.3 c-e	10.93 h-m	0.296 e-k	0.197 m-p	0.216 b-e
SP2876	Chromatin/Sorghum Partners	F	M	Y	53.0 b-d	70.1 d-f	9.96 mn	0.279 g-m	0.195 n-p	0.215 b-e
Great Scott BMR R	Scott Seed	F	L	Y	53.6 bc	72.3 b-d	11.89 d-i	0.310 d-j	0.256 b-e	0.198 e-j
Great Scott BMR W	Scott Seed	F	L	Y	53.0 b-e	70.8 c-e	12.25 b-h	0.358 b-e	0.238 e-i	0.210 b-f
Premium Stock LS	Scott Seed	F	PS	N	42.6 m-o	68.0 fg	12.78 b-f	0.335 c-g	0.223 i-k	0.216 b-e

Table 3. continued.

Hybrid Information[1]					Nutrient Composition & Calculations[2]					
Hybrid	**Company**	**Type**	**Maturity**	**BMR**	**30 hr NDFd**	**240 hr NDFd**	**ASH**	**CA**	**P**	**MG**
50315X	Scott Seed	F	M	N	45.2 j-m	63.6 h-k	11.39 g-k	0.247 k-m	0.259 b-d	0.171 k-m
50632X	Scott Seed	F	M	Y	50.0 e-h	69.2 ef	12.32 b-g	0.294 f-l	0.311 a	0.173 k-m
849F	Pioneer	F	ML	N	39.1 q	56.6 n	9.91 mn	0.353 b-f	0.217 j-l	0.203 d-i
841F	Pioneer	F	L	N	44.5 k-n	69.1 ef	13.44 ab	0.313 d-j	0.242 d-h	0.201 e-i
Silo Milo Plus	Lockwood Seed & Grain	F	L	N	48.3 g-i	62.9 i-k	10.84 i-m	0.253 j-m	0.248 c-g	0.167 lm
GW 600	Gayland Ward Seed	F	M	Y	53.0 b-d	72.2 b-d	12.77 b-f	0.359 b-d	0.228 h-j	0.188 g-l
Silo Pro	Gayland Ward Seed	F	L	Y	53.0 b-d	71.2 c-e	12.19 b-i	0.334 c-g	0.243 c-h	0.203 d-i
GW 400	Gayland Ward Seed	F	ME	Y	53.0 b-d	72.3 b-d	12.86 b-e	0.365 b-d	0.208 k-n	0.199 e-i
EX 10216	Gayland Ward Seed	F	?	?	54.6 bc	73.0 bc	13.14 b-d	0.391 a-c	0.204 k-o	0.187 h-l
EX 10217	Gayland Ward Seed	F	ME	N	47.8 h-j	69.1 ef	11.94 d-i	0.324 d-h	0.173 qr	0.209 b-g
GW 2120	Gayland Ward Seed	F	M	N	44.2 k-n	63.0 i-k	11.02 g-m	0.329 c-g	0.206 k-n	0.198 e-j
Sweetsix	Gayland Ward Seed	SG	ME	Y	45.7 i-l	63.4 h-k	10.28 j-n	0.287 g-m	0.214 j-m	0.153 m
Nutra King	Gayland Ward Seed	SG	ME	Y	44.0 l-n	64.3 h-j	11.37 g-l	0.317 d-i	0.243 c-h	0.182 i-l
Supersugar-2	Gayland Ward Seed	SG	L	N	40.1 o-q	62.4 kl	11.11 g-m	0.322 d-i	0.2112 j-n	0.208 c-h
Sweetforever	Gayland Ward Seed	SG	PS	Y	50.7 d-g	70.5 c-f	11.48 f-j	0.317 d-i	0.187 o-q	0.213 b-f
Tifleaf III	Gayland Ward Seed	Millet	ME	N	52.3 c-f	71.1 c-e	14.69 a	0.453 a	0.236 f-i	0.323 a
Means **CV**					**47.98** **7.38**	**67.13** **5.09**	**11.54** **14.65**	**0.310** **24.76**	**0.225** **10.39**	**0.200** **13.48**
Location										
KARE1					**50.48 a**	**71.09 a**	**11.32 b**	**0.370 a**	**0.201 c**	**0.253 a**
KARE2					**51.08 a**	**66.95 b**	**9.93 c**	**0.327 b**	**0.202 c**	**0.206 b**
WREC					**46.31 b**	**65.74 c**	**11.67 b**	**0.292 c**	**0.219 b**	**0.175 c**
UC Davis					**44.06 c**	**64.80 d**	**13.26 a**	**0.256 d**	**0.278 a**	**0.166 d**

Table 3. continued.

Hybrid Information[1]					Nutrient Composition & Calculations[2]				
Hybrid	**Company**	**Type**	**Maturity**	**BMR**	**% K**	**% S**	**Milk Lbs ton^{-1}**	**Rel. Feed Value**	**Rel. Forage Quality**
BDX204	Ceres	F	E	N	1.65 s	0.103 m-o	2638.9 a-g	103.54 d-h	99.75 f-j
BDX206	Ceres	F	E	N	1.81 o-s	0.102 m-o	2327.6 i-o	94.09 h-k	84.38 k-n
BDX207	Ceres	F	E	N	2.33 a-e	0.138 bc	2109.4 n-p	85.01 k-n	80.94 m-o
Silo 700D-BMR	Richardson Seeds	F	L	Y	2.14 d-h	0.113 h-m	2687.8 a-f	107.26 d-f	115.90 a-e
Silo 700D	Richardson Seeds	F	L	N	1.84 m-s	0.098 no	2704.6 a-f	126.63 ab	110.88 a-h
Sweeter N Honey II	Richardson Seeds	F	L	N	1.88 k-r	0.115 h-m	2163.3 n-p	90.60 i-l	69.81 n-p
Sweeter N Honey BMR	Richardson Seeds	F	ME	Y	2.07 f-k	0.130 c-g	2733.9 a-e	107.00 d-f	123.93 a
Bundle King BMR	Richardson Seeds	F	L	Y	2.24 a-f	0.112 j-m	2450.3 g-l	86.02 j-n	103.13 e-i
RS1X	Richardson Seeds	F	ME	N	2.02 h-o	0.108 k-o	2507.3 e-l	112.56 c-e	98.74 g-k
RS2X	Richardson Seeds	F	ME	N	2.05 f-m	0.121 f-k	2699.6 a-f	126.34 ab	115.00 a-f
AF 7102	Alta (Advanta)	F	E	Y	1.70 q-s	0.118 g-l	2809.3 ab	129.50 a	122.40 ab
AF 8301	Alta (Advanta)	F	M	N	1.67 rs	0.097 o	2854.5 a	131.28 a	114.35 a-f
AF 7401	Alta (Advanta)	F	L	Y	2.37 a-c	0.145 b	2321.8 j-o	97.58 f-j	97.81 g-l
SP1880	Chromatin/Sorghum Partners	F	L	N	1.84 n-s	0.098 no	2009.7 pq	78.32 mn	62.02 p
SP1615	Chromatin/Sorghum Partners	F	PS	N	2.33 a-d	0.120 g-l	1783.4 q	77.0 n	62.59 p
NK 300	Chromatin/Sorghum Partners	F	ME	N	1.80 p-s	0.102 m-o	2707.4 a-f	122.13 a-c	106.93 c-i
SP 3902	Chromatin/Sorghum Partners	F	L	Y	2.08 f-k	0.126 c-i	2740.3 a-d	112.76 c-e	121.28 a-c
SP 3903	Chromatin/Sorghum Partners	F	ML	Y	2.22 b-h	0.126 c-i	2484.3 f-l	100.87 e-i	105.63 d-i
SP 2774	Chromatin/Sorghum Partners	F	M	Y	2.12 e-i	0.107 l-o	2598.7 b-h	97.23 f-j	106.49 c-i
SP2876	Chromatin/Sorghum Partners	F	M	Y	1.93 i-p	0.107 l-o	2675.3 a-g	100.26 f-i	107.98 b-i
Great Scott BMR R	Scott Seed	F	L	Y	2.19 c-h	0.124 c-j	2552.7 c-j	103.07 d-h	107.43 b-i
Great Scott BMR W	Scott Seed	F	L	Y	2.17 c-h	0.131 c-g	2559.0 c-h	106.76 d-g	109.36 a-i
Premium Stock LS	Scott Seed	F	PS	N	2.40 ab	0.1256 c-i	1803.4 q	76.60 n	60.31 p

Table 3. continued.

Hybrid Information[1]					Nutrient Composition & Calculations[2]				
Hybrid	**Company**	**Type**	**Maturity**	**BMR**	**% K**	**% S**	**Milk Lbs ton^{-1}**	**Rel. Feed Value**	**Rel. Forage Quality**
50315X	Scott Seed	F	M	N	2.01 h-o	0.113 h-m	2558.5 c-i	112.65 c-e	101.71 e-j
50632X	Scott Seed	F	M	Y	2.23 b-g	0.134 b-f	2714.0 a-f	124.03 a-c	120.94 a-c
849F	Pioneer	F	ML	N	1.85 m-s	0.113 h-m	2602.6 b-h	114.78 b-d	94.18 i-m
841F	Pioneer	F	L	N	2.44 a	0.137 b-d	1876.0 q	81.363 l-n	66.53 op
Silo Milo Plus	Lockwood Seed & Grain	F	L	N	1.88 k-r	0.120 g-l	2776.2 a-c	121.62 a-c	118.73 a-d
GW 600	Gayland Ward Seed	F	M	Y	2.16 c-h	0.127 c-h	2402.2 h-m	96.49 f-k	98.99 g-k
Silo Pro	Gayland Ward Seed	F	L	Y	2.13 d-i	0.134 b-f	2588.9 b-h	108.05 d-f	111.45 a-g
GW 400	Gayland Ward Seed	F	ME	Y	2.07 f-l	0.122 e-k	2384.4 h-n	93.75 h-k	95.73 h-m
EX 10216	Gayland Ward Seed	F	?	?	2.10 f-i	0.135 b-e	2407.7 h-m	94.84 g-k	101.02 e-j
EX 10217	Gayland Ward Seed	F	ME	N	1.86 l-r	0.113 i-m	2277.6 l-o	89.68 j-m	83.20 l-n
GW 2120	Gayland Ward Seed	F	M	N	1.85 m-s	0.113 h-m	2510.2 d-k	106.75 d-g	94.73 i-m
Sweetsix	Gayland Ward Seed	SG	ME	Y	1.67 rs	0.123 d-j	2588.1 b-h	104.41 d-h	97.73 g-l
Nutra King	Gayland Ward Seed	SG	ME	Y	1.90 j-q	0.126 c-i	2506.1 e-l	107.97 d-f	95.28 i-m
Supersugar-2	Gayland Ward Seed	SG	L	N	2.03 g-n	0.111 j-n	2154.8 n-p	91.00 i-l	71.56 n-p

Table 3. continued.

Hybrid Information[1]					Nutrient Composition & Calculations[2]				
Hybrid	**Company**	**Type**	**Maturity**	**BMR**	**% K**	**% S**	**Milk Lbs ton^{-1}**	**Rel. Feed Value**	**Rel. Forage Quality**
Sweetforever	Gayland Ward Seed	SG	PS	Y	2.13 d-i	0.104 m-o	2318.1 k-o	86.72 j-n	87.29 j-m
Tifleaf III	Gayland Ward Seed	Millet	ME	N	2.41 ab	0.167 a	2182.3 m-o	97.36 f-j	95.18 i-m
Means					**2.03**	**0.118**	**2456.0**	**102.93**	**97.93**
CV					**12.60**	**14.08**	**11.68**	**14.60**	**19.38**
Location									
KARE1					**2.03 b**	**0.130 a**	**2295.9 d**	**87.21 c**	**86.58 c**
KARE2					**1.92 c**	**0.126 b**	**2628.0 a**	**101.76 b**	**105.89 a**
WREC					**2.24 a**	**0.121 c**	**2406.0 c**	**103.5 b**	**96.89 b**
UC Davis					**1.94 c**	**0.097 d**	**2505.5 b**	**119.0 a**	**103.10 a**

[1]Hybrid information provided by seed companies. SG=Sudangrass, F=Forage sorghum, E=Early, ME=Medium Early, M=Medium, ML=Medium Late, L=Late, PS=Photoperiod Sensitive.

[2]Means followed by the same letter do not significantly differ using LSD (P=0.01)

Table 4. Top hybrids in the 2016 UC Sorghum Forage Trials based on yield and lodging[1].

Hybrid	Company	Type	Maturity	BMR	% Lodging	Ton ac^{-1} 65% Moist	ton per acre inch water	% CP	240 hr NDFd	Milk Lbs ton^{-1}	Rel. Forage Quality
Great Scott BMR R	Scott Seed	F	L	Y	9.6	23.6	0.976	7.7	72.3	2552.7	107.43
SP 3903	Chromatin/Sorghum Partners	F	ML	Y	3.3	21.8	0.920	7.4	72.4	2484.3	105.63
RS1X	Richardson Seeds	F	ME	N	1.7	21.6	0.914	7.1	64.3	2507.3	98.74
BDX207	Ceres	F	E	N	8.8	21.5	0.883	7.1	72.1	2109.4	80.94
841F	Pioneer	F	L	N	9.2	21.0	0.880	7.7	69.1	1876.0	66.53
Silo Milo Plus	Lockwood Seed & Grain	F	L	N	4.6	20.8	0.874	7.3	62.9	2776.2	118.73
SP 3902	Chromatin/Sorghum Partners	F	L	Y	7.5	20.8	0.872	7.5	70.7	2740.3	121.28
AF 7401	Alta (Advanta)	F	L	Y	3.3	19.8	0.847	8.7	74.2	2321.8	97.81
50315X	Scott Seed	F	M	N	3.8	19.8	0.833	7.2	63.6	2558.5	101.71
Silo Pro	Gayland Ward Seed	F	L	Y	4.6	19.6	0.836	8.0	71.2	2588.9	111.45
Great Scott BMR W	Scott Seed	F	L	Y	5.8	19.4	0.822	7.7	70.8	2559.0	109.36
RS2X	Richardson Seeds	F	ME	N	0.8	18.3	0.789	8.0	62.9	2699.6	115.00
50632X	Scott Seed	F	M	Y	5.8	18.2	0.766	9.2	69.2	2714.0	120.94

[1]The top hybrid list was derived by taking those hybrids with the highest yields and eliminating those hybrids that lodged by more than 10%.

Table 5. Top yielding hybrids that yielded over 20.0 tons acre^{-1} averaged over the UC Forage Trials in 2016.

Hybrid	Company	Type	Maturity	BMR	% Lodging	Ton ac^{-1} 65% Moist	ton per acre inch water	240 hr NDFd	Milk Lbs ton^{-1}	Rel. Forage Quality
SP1880	Chromatin/Sorghum Partners	F	L	N	30.4	31.8	1.327	63.1	2009.7	62.02
Sweeter N Honey II	Richardson Seeds	F	L	N	32.9	27.2	1.136	61.9	2163.3	69.81
SP1615	Chromatin/Sorghum Partners	F	PS	N	27.1	27.1	1.187	65.3	1783.4	62.59
AF 8301	Alta (Advanta)	F	M	N	34.6	25.7	1.065	56.7	2854.5	114.35
SP2876	Chromatin/Sorghum Partners	F	M	Y	31.7	25.1	1.042	70.1	2675.3	107.98
Silo 700D	Richardson Seeds	F	L	N	16.7	24.1	1.023	59.9	2704.6	110.88
Supersugar-2	Gayland Ward Seed	SG	L	N	20.0	24.1	1.026	62.4	2154.8	71.56
Premium Stock LS	Scott Seed	F	PS	N	15.0	23.7	0.988	68.0	1803.4	60.31
Great Scott BMR R	Scott Seed	F	L	Y	9.6	23.6	0.976	72.3	2552.7	107.43
Silo 700D-BMR	Richardson Seeds	F	L	Y	13.3	22.9	0.960	71.0	2687.8	115.90
SP 2774	Chromatin/Sorghum Partners	F	M	Y	20.4	22.6	0.958	71.3	2598.7	106.49
NK 300	Chromatin/Sorghum Partners	F	ME	N	26.3	22.0	0.909	59.1	2707.4	106.93
849F	Pioneer	F	ML	N	56.3	21.9	0.890	56.6	2602.6	94.18
SP 3903	Chromatin/Sorghum Partners	F	ML	Y	3.3	21.8	0.920	72.4	2484.3	105.63
RS1X	Richardson Seeds	F	ME	N	1.7	21.6	0.914	64.3	2507.3	98.74
BDX207	Ceres	F	E	N	8.8	21.5	0.883	72.1	2109.4	80.94
GW 2120	Gayland Ward Seed	F	M	N	24.2	21.2	0.893	63.0	2510.2	94.73
841F	Pioneer	F	L	N	9.2	21.0	0.880	69.1	1876.0	66.53
Sweetforever	Gayland Ward Seed	SG	PS	Y	42.9	21.0	0.893	70.5	2318.1	87.29
SP 3902	Chromatin/Sorghum Partners	F	L	Y	7.5	20.8	0.872	70.7	2740.3	121.28
Silo Milo Plus	Lockwood Seed & Grain	F	L	N	4.6	20.8	0.874	62.9	2776.2	118.73
BDX204	Ceres	F	E	N	29.6	20.1	0.827	65.6	2638.9	99.75

[1]Hybrid information provided by seed companies. SG=Sudangrass, F=Forage sorghum, ME=Medium Early, M=Medium, ML=Medium Late, L=Late, PS=Photoperiod Sensitive.