Final Report
UC-ANR
2020 Field Research on Sorghum Forages for the California Dairy Industry

Jeff Dahlberg[1], Bob Hutmacher[2], Dan Putnam[3], Nick Clark[4], Julie Pedraza[1], Cayci Allison[1], Chris de Ben[3], and Merf Solorio[2]

Introduction

In California the San Joaquin Valley is home to a multi-billion dollar dairy industry dependent on nutritional silage for animal feed. Limited water allocations, the introduction of the Sustainable Groundwater Management Act and drought over the past decade in the state have renewed interest in forage sorghums [*Sorghum bicolor* (L.) Moench], an inherent drought tolerant crop, as a potential alternative to corn silage. Sorghum has few disease and insect issues, though Sugarcane Aphid (SCA) remains a problem in sorghum production in the state. SCA is a relatively new pest in sorghum and can be controlled with insecticides and managed through the use of resistant hybrids. Sorghum forage data from 2020 planted at the Kearney Agricultural Research and Extension (KARE) Center, the Westside Research and Extension (WREC) Center and at the UC Davis Research Farm (Davis) are part of a long-term forage demonstration trial started in 2011. Historical reports can be found at the sorghum website: sorghum.ucanr.edu.

Methods and Materials

Fifty-one hybrids provided by 6 seed companies were used in this study. These hybrids were a combination of brown midrib (BMR), traditional and photoperiod sensitivite (PS) sorghums. A randomized complete block design in four row plots on 30-inch beds were used to plant the hybrids which were analyzed as a split-plot design using the statistical package SAS with location analyzed as the sub-plot. Overhead sprinklers were used to irrigate the plots at KARE and WREC, and flood irrigation was used at Davis. The 2020 growing season compared to previous seasons experienced reduced precipitation, prolonged high temperatures, and poor air quality. The approximate rainfall totals from January through May were 75% of normal for all trial locations. Irrigation for trials at WREC, KARE and Davis were based on ET demands. The first planting at KARE received a preplant irrigation of 0.76 inches on May 4, 2020 and a total of 16.72 inches of applied irrigation. The second planting at KARE received a preplant irrigation of 0.77 inches on May 22, 2020 and a total of 17.32 inches of applied irrigation. Rainfall totals from January through May 4, 2020 prior to the first planting at KARE were 4.9 inches with a one day rainfall event of 0.32 inches prior to the second planting on June 1, 2020. No rainfall was recorded throughout the growing season. Rainfall totals from January through June 3 prior to planting at WREC were 4.5 inches, while 1.3 inches of rainfall were recorded throughout the growing season. At WREC, a total of 2 inches were applied prior to June 3 planting using

[1] Director, Kearney Agricultural Research and Extension Center, 9240 S. Riverbend Ave., Parlier, CA 93648, phone: 559-646-6060, Email: jadahlberg@ucDavis.edu; cayci.allison@ucanr.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; rmsolorio@ucanr.edu

[3] 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; cmdeben@ucdavis.edu

[4] Farm Advisor, UCCE Kings County, 680 Campus Drive, Suite A, Hanford, CA 93230, phone: 559-852-2788; Email: neclark@ucanr.edu

overhead sprinklers to ensure good stand establishment. An additional 12.5 inches were applied by overhead sprinkler irrigation over the course of the season. In total, 15.8 inches of irrigation were applied in the 2020 season. Total rainfall from January through June prior to planting at Davis was 3.8 inches, while 1.3 inches fell throughout the growing season. Trials were harvested approximately 100 days after planting, and data collection methods for the samples is described below in "Data Collected.".

Other cultural practices and study information:

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 June 1, 2020
Planting Rate:	100,000 seed $acre^{-1}$
Seed Method:	Almaco 4 row plot planter
Fertilizer:	200 lbs. N $acre^{-1}$ (46-0-0), 25 lbs. N $acre^{-1}$ and Solubor 4 lbs to provide less than 1lb of Boron, and 52 lbs. PO^{3-} $acre^{-1}$ as 11-52-0, and 500 lbs. K_2O $acre^{-1}$ as 0-0-50 applied pre-plant before May 5 for 1st planting and June 1 for 2nd planting
Herbicide:	Dual Magnum at 1.3 pints $acre^{-1}$ as a pre-plant
Pesticide:	Sivanto Prime 14 fl oz $acre^{-1}$ with Latron 1956 at 5 fl oz $acre^{-1}$ August 12 for 1st planting and 2nd planting
Irrigation:	See narrative above
Silage Harvest Date:	Plots harvested with Wintersteiger Cibus S forage chopper on August 17, late harvest September 8 and September 14, 2020

Trial Location:	Westside Research and Extension Center, Five Points
Cooperator:	UC-ANR
Previous Crop:	Sorghum
Soil Type:	Panoche clay loam
Plot Size:	Four, 30-inch rows by 17 ft
Replications:	3
Study Design:	Split-Plot
Planting Date:	June 3, 2020
Planting Rate:	100,000 seed $acre^{-1}$
Seed Method:	Almaco 4 row plot planter
Fertilizer:	Total 100 lbs N $acre^{-1}$ pre-plant, and layby 90 lbs N $acre^{-1}$
Herbicide:	Dual Magnum 24 fl oz $acre^{-1}$ as pre-emergent, Clarity 8 fl oz $acre^{-1}$ and Prowl-H_20 at 32 fl oz $acre^{-1}$ as a post-emergent application.
Pesticides:	Sivanto Prime 14 fl oz $acre^{-1}$ on August 21, August 31 and September 13

Irrigation:	Overhead Sprinklers for stand establishment – see narrative for amounts
Silage Harvest Date:	September 5th, 2020
Trial Location:	UC Davis Research Station, Davis
Cooperator:	UC-ANR
Previous Crop:	Fallow
Soil Type:	Yolo loam
Plot Size:	Four, 30-inch rows by 20 ft
Replications:	3
Study Design:	Split-Plot
Planting Date:	May 29, 2020
Planting Rate:	100,000 seed $acre^{-1}$
Seed Method:	Wintersteiger Self Propelled Drill Planter
Fertilizer:	25 lbs. N $acre^{-1}$ (8-28-6) on June 11, 82 lbs. N $acre^{-1}$ 8-28-6 on July 12.
Herbicide:	Dual Magnum as pre-plant
Irrigation:	See above narrative
Silage Harvest Date:	Plots harvested with Wintersteiger Cibus S forage chopper September 16, 2020

Data Collected:

1. Plant population stands
2. Plant height (cm) at silage harvest
3. Lodging at silage harvest. Percent of fallen or significantly leaning plants per plot.
4. Whole-plant moisture content at harvest.
5. Forage (silage) yield. The middle two rows of each plot were harvested with a Wintersteiger Cibus S forage chopper. Reported at 65% moisture in tons $acre^{-1}$.
6. Nutrient analysis: Samples were collected from the forage chopper in the field, weighed and then placed in a 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: % 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. uNDFom240: undigested NDF over 240 hours corrected for ash
    j. WSC Sugar: Water soluble carbohydrates
    k. ESC Sugar: Ethanol soluble carbohydrates
    l. NFC: Non-fiber carbohydrate; starch, simple sugars and organic acids

m. 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.
n. Milk lbs. ton^{-1}: A projection of potential milk yield per ton for forage dry matter.

Results

Table 1 provides a summary of nutritional analyses, agronomical traits and yield based on types of forage sorghums grown in all locations. See Tables 2 and 3 for a comparison of the different hybrids for agronomic, yield, and nutritional characteristics.

Table 1. Summary of key forage characteristics by type of forage grown at four locations, Kearney (2 planting dates), West Side, and Davis in 2020.

Sorghum Type[1]	% Lodging @ Harvest[2]	Tons/ac @65% Moist.[2]	% Crude Protein[2]	% ADF[2]	% NDF[2]	% Lignin[2]	% NDF d30[2]	% NDF d240[2]	Milk lbs/ton DM[2]	Relative Feed Quality (RFQ)[2]
PSBMR (60)	29.25 a	13.91 c	9.32 a	37.64 a	57.20 a	3.48 b	59.39 a	74.69 a	2217.8 c	106.16 b
PS (60)	21.17 ab	16.01 ab	8.67 b	58.20 a	58.20 a	4.20 a	55.39 c	72.84 b	2289.92 b	99.40 c
FBMR (127)	19.84 b	15.03 bc	9.17 a	34.09 b	58.20 a	3.39 b	56.88 b	73.23 b	2533.88 a	115.87 a
FNON (262)	18.47 b	16.83 a	8.71 b	34.52 b	53.90 b	4.22 a	52.21 d	70.43 c	2510.38 a	107.02 b
Trial Avg.	20.40	15.94	8.89	35.15	54.78	3.92	54.60	71.92	2455.77	108.23

[1]Number in parenthesis is the number of hybrids in each sorghum type. PSBMR = Photoperiod sensitive brown mid-rib; PS = Photoperiod sensitive; FBMR= Forage brown mid-rib; FNON= forage.
[2]Means followed by the same letter do not significantly differ using LSD (P=0.05)

This year's lodging ranged from 0.0 to 61.7% which was lower than previous years which were as high as 80% (Table 2). Lodging between the sorghum types indicated photoperiod sensitive brown midrib hybrids (PSBMRs) had higher lodging affects compared to the other forage types (Table 1). Lodging was significantly lower at the WREC and KARE1 plantings whereas Davis had significantly higher lodging % (Table 2).

Although Davis had the highest lodging occurrence, it had the tallest and greatest yield acre^{-1} than the other locations. The second planting at KARE2 had a moderately low percentage of lodging with moderately tall forage and tonnage per acre whereas the first planting of KARE1 had the lowest lodging, shortest forage and the least tonnage acre^{-1} (Table 2). The experimental forage trial yields ranged from a high 21.67 to 11.16 tons acre^{-1} with an average of 15.97 tons acre^{-1} which is less than previous years (Tables 1 and 2).

Brown mid-rib forages tended to be on the higher side in digestibility measurements of ADF, NDF, NDFd30, and NDFd240. Both the normal and BMR forages had higher Milk lbs ton^{-1} and Relative Feed Quality than the the PS and PSBMR (Table 1).

KARE1 had the highest amount of milk lbs ton^{-1}, and overall higher sugars, NFC, RFQ, 30- and 240-hour NDFd with moderately lower 240-hour uNDFom and lower lignin % (Table 3). Late planting at KARE showed significantly higher ESC sugar, CP, NDF, Lignin, 30- and 240-hour NDFd with lower milk lbs ton^{-1} (Table 3).

The highest yields were ranked in this study by taking the top 10 hybrids having less than 10% lodging (Table 4). Of these hybrids, yield ranged from a low of 16.24 tons acre^{-1} (Scott Seed X52053) a high of 21.67 tons acre^{-1} (Gayland Ward Seed 19042).

Yield is the greatest factor in the selection of sorghum forages for producers. Table 5 highlights the top yielding hybrids that produced more than 16.0 tons acre^{-1} of yield. The highest yielding forage sorghum was 19042 from Gayland Ward Seed at 21.67 tons per acre with no observance of lodging followed by Dyna-Gro Seed Fullgraze II at 21.39 tons per acre. In previous years lodging correlated directly with highest yields, however this year lodging percentages were lower in correlation with yield of sorghum forage.

Discussion

Experimental and commercial forage sorghums (51) were evaluated for quality and yield in the tenth year of the UC California Sorghum Forage Demostration Research Plots. This year's plots include four sites, KARE1, KARE2, WREC and Davis. 2020 was a difficult year with challenges of conducting research plots under COVID restrictions and unfavorable weather. Below normal winter rainfall and long, hot weather in the middle of the growing season coupled with extremely poor air quality due to the unprecedented fires in the state caused unusual environmental conditions this past year. Sorghum yields were lower than previous years, and ash content in samples sent for quality analyses were higher than normal and this could be attributed to the poor air quality and reduced sunlight caused by the hazy skies. Sorghum appeared to be impacted by these environmental constraint, although a recent UC study found that wildfire ash deposition had no adverse affect on crop safety for animal feeding (https://ucanr.edu/sites/glenn/files/334224.pdf). Yields and lodging were greatest at the Davis location, however quality parameters were better at the other locations. With continued pressure on farmers to more closely manage their irrigation, sorghum continues to be a viable option for limited irrigation and nutrient inputs for reliable production of high-quality forage for ensiling in California. Water and fertilizer are 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 sorghum forages in the State.

Table 2. 2020 comparisons of sorghum forage hybrids and locations for agronomic characteristics and yield at KARE1, KARE2, WREC, and Davis by seed company.

Hybrid Information[1]					Agronomic Measurements		
Hybrid	**Company**	**Type**	**Maturity**	**BMR**	**% Lodging**	**Height (cm)**	**Tons acre^{-1} 65% Moist**
F70FS91 BMR	Dyna-Gro Seed	F	E	Y	40.42 a-d	187.67 i-p	12.82 j-n
F71FS72 BMR	Dyna-Gro Seed	F	E	Y	22.50 c-l	166.26 k-u	15.84 d-m
F72FS05	Dyna-Gro Seed	F	ME	N	5.83 j-m	207.63 f-k	18.04 a-g
Super Sile 30	Dyna-Gro Seed	F	ME	N	29.14 b-i	210.17 f-j	15.77 d-m
F72FS25 BMR	Dyna-Gro Seed	F	M	Y	10.00 g-m	142.95 q-v	16.28 c-l
F74FS23 BMR	Dyna-Gro Seed	F	M	Y	47.92 a-b	174.95 j-s	12.69 k-n
F74FS72 BMR	Dyna-Gro Seed	F	ML	Y	8.33 i-m	167.36 k-u	16.05 d-l
Super Sile 20	Dyna-Gro Seed	F	ML	N	27.08 b-j	243.67 c-f	18.02 a-g
TopTon	Dyna-Gro Seed	F	L	N	30.83 b-g	191.39 h-n	16.78 c-j
Dual Forage SCA	Dyna-Gro Seed	F	ML	N	0.00 m	145.94 q-v	16.87 c-j
Danny Boy II BMR	Dyna-Gro Seed	F	PS	Y	47.50 a-b	244.98 b-f	11.22 n
First Graze	Dyna-Gro Seed	F	ME	N	33.33 b-f	224.41 e-i	18.07 a-g
Super Sweet 10	Dyna-Gro Seed	F	ME	N	47.50 ab	234.25 d-g	16.75 c-k
Dynagraze II	Dyna-Gro Seed	F	ME	N	45.00 a-b	230.52 e-h	16.91 c-i
Fullgraze II	Dyna-Gro Seed	F	ML	N	30.42 b-h	300.14 a	21.39 a-b
Fullgraze II BMR	Dyna-Gro Seed	F	ML	Y	61.67 a	281.53 a-c	14.55 f-n
Dual Forage SCA	Dyna-Gro Seed	F	MF	N	17.50 e-m	148.79 o-v	17.76 a-h
NK300	Sorghum Partners	F	ME	N	9.52 g-m	139.73 r-v	15.80 d-m
SP3905 BD BMR	Sorghum Partners	F	ME	Y	5.00 k-m	162.45 m-v	14.84 e-n
SS405	Sorghum Partners	F	L	N	36.67 b-e	272.52 a-d	18.63 a-f
NK300	Sorghum Partners	F	ME	N	6.67 j-m	170.00 j-t	20.16 a-c
SP3904 BD BMR	Sorghum Partners	F	ML	Y	8.75 h-m	176.43 j-s	17.97 a-g
SP4105	Sorghum Partners	F	E	Y	22.50 c-l	192.91 g-n	13.34 i-n
SP3905 BD BMR	Sorghum Partners	F	ME	Y	22.22 c-l	146.09 q-v	14.52 g-n
Sordan Headless	Sorghum Partners	F	E	N	19.17 d-m	260.75 a-e	16.82 c-j
OPAL (x033)	Mojo Seed	F	M	N	12.50 f-m	152.84 n-v	14.86 e-n
715X	Mojo Seed	F	M	N	0.00 m	171.72 j-t	16.13 c-l
713X	Mojo Seed	F	M	N	22.92 c-l	180.86 j-r	13.81 h-n
714X	Mojo Seed	F	M	N	9.17 g-m	163.39 m-v	17.48 b-h
XF251	Richardson Seed-5	F	E	N	16.50 e-m	197.48 g-m	15.76 d-m
XF382	Richardson Seed-7	F	E	Y	26.67 b-k	193.21 g-n	15.33 d-m
XF254	Richardson Seed-8	F	L	Y	12.27 f-m	189.59 h-o	18.08 a-g
XF255	Richardson Seed-9	F	L	N	22.00 c-l	162.56 m-v	18.72 a-e
XF260	Richardson Seed-10	F	L	N	4.17 l-m	177.62 j-s	17.78 a-h
18096	Gayland Ward Seed-1	F	M		10.42 g-m	157.79 m-v	15.72 d-m
20249	Gayland Ward Seed-2	F	M		33.33 b-f	148.70 o-v	14.16 g-n
18153	Gayland Ward Seed-2	F	M		60.00 a	165.36 l-u	13.10 i-n

Table 2. continued.

Hybrid Information[1]					Agronomic Measurements		
Hybrid	**Company**	**Type**	**Maturity**	**BMR**	**% Lodging**	**Height (cm)**	**Tons acre^{-1} 65% Moist**
19156	Gayland Ward Seed-2	F	M		35.83 b-e	205.87 f-l	15.58 d-m
19040	Gayland Ward Seed-3	F	L		0.00 m	93.00 w	11.16 n
19042	Gayland Ward Seed-3	F	L		0.00 m	158.83 m-v	21.67 a
19181	Gayland Ward Seed-3	F	L		0.00 m	130.63 t-w	11.79 m-n
19038	Gayland Ward Seed-4	F	L		0.00 m	146.97 p-v	16.18 c-l
20163	Gayland Ward Seed-4	F	L		0.00 m	140.07 r-v	18.17 a-g
19179	Gayland Ward Seed-4	F	L		0.00 m	136.97 s-v	14.68 e-n
X52265	Scott Seed	F	ML	N	0.00 m	127.94 u-w	16.13 c-l
X52053	Scott Seed	F	ML	N	0.00 m	159.42 m-v	16.24 c-l
X50315	Scott Seed	F	ML	N	6.25 j-m	123.54 v-w	16.70 c-k
X50654	Scott Seed	F	PS	Y	5.83 j-m	154.18 n-v	12.46 l-n
X50651	Scott Seed	F	M	Y	19.17 d-m	182.27 i-q	13.12 i-n
X54243	Scott Seed	F	L	Y	43.75 a-c	285.13 a-b	19.17 a-d
X53554	Scott Seed	F	PS	N	43.33 a-c	257.92 b-e	15.54 d-m
Means							
CV					**20.33**	**187.90**	**16.00**
Mean					**108.89**	**22.25**	**25.72**
Location							
Davis					**59.4 a**	**232.4 a**	**20.0 a**
KARE1					**4.0 c**	**148.4 d**	**13.6 c**
KARE2					**15.3 b**	**197.1 b**	**15.1 b**
WREC					**4.9 c**	**179.0 c**	**15.7 b**

[1]Hybrid information provided by seed companies. Under type, F=Forage sorghum. Under Maturity, 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=0.05)

Table 3. 2020 comparisons of sorghum forage hybrids and locations for the nutritional characteristic's crude protein, ADF, NDF, Lignin, Starch and Fat at KARE1, KARE2, WREC, and Davis by seed company.

Hybrid Information[1]					Nutrient Composition & Calculations[2]					
Hybrid	**Company**	**Type**	**Maturity**	**BMR**	**% Crude Protein**	**% ADF**	**% NDF**	**% Lignin**	**% Starch**	**% Fat**
F70FS91 BMR	Dyna-Gro Seed	F	E	Y	9.27 a-g	36.22 d-i	56.22 f-j	3.51 r-w	1.41 p-s	2.57 d-j
F71FS72 BMR	Dyna-Gro Seed	F	E	Y	9.03 b-i	32.48 o-u	51.08 o-t	3.09 w	5.77 g-n	2.79 a-c
F72FS05	Dyna-Gro Seed	F	ME	N	8.66 b-j	36.28 d-i	57.14 d-h	4.41 b-f	2.86 l-s	2.32 m-u
Super Sile 30	Dyna-Gro Seed	F	ME	N	8.44 d-k	38.21 b-d	59.26 b-d	4.41 b-f	0.50 r-s	2.18 s-x
F72FS25 BMR	Dyna-Gro Seed	F	M	Y	9.76 a-c	34.88 h-m	54.66 h-m	3.28 v-w	3.26 j-s	2.66 a-f
F74FS23 BMR	Dyna-Gro Seed	F	M	Y	9.01 b-i	33.91 k-p	52.75 k-r	3.14 w	4.56 h-p	2.51 e-m
F74FS72 BMR	Dyna-Gro Seed	F	ML	Y	9.26 a-g	35.30 g-k	55.23 g-k	3.22 v-w	3.15 k-s	2.63 b-g
Super Sile 20	Dyna-Gro Seed	F	ML	N	7.83 i-m	37.86 b-e	58.15 c-f	4.34 b-i	1.98 o-s	2.12 v-x
TopTon	Dyna-Gro Seed	F	L	N	8.19 e-k	37.38 b-f	57.71 c-g	3.96 g-q	2.29 n-s	2.28 p-w
Dual Forage SCA	Dyna-Gro Seed	F	ML	N	9.57 a-d	30.84 t-u	47.64 u	4.09 c-o	16.25 a-b	2.56 d-k
Danny Boy II BMR	Dyna-Gro Seed	F	PS	Y	9.81 a-b	38.16 b-d	56.49 e-i	3.27 v-w	0.12 s	2.36 k-s
First Graze	Dyna-Gro Seed	F	ME	N	8.06 g-l	32.82 n-t	49.91 s-u	4.51 b-c	14.22 a-c	2.50 e-m
Super Sweet 10	Dyna-Gro Seed	F	ME	N	8.40 d-k	32.73 n-t	50.25 q-u	4.37 b-h	13.60 a-c	2.47 f-p
Dynagraze II	Dyna-Gro Seed	F	ME	N	8.69 b-j	33.19 l-s	49.88 t-u	4.49 b-d	15.10 a-c	2.41 i-q
Fullgraze II	Dyna-Gro Seed	F	ML	N	7.97 h-l	38.03 b-d	61.75 a-b	4.42 b-f	0.60 q-s	2.29 o-w
Fullgraze II BMR	Dyna-Gro Seed	F	ML	Y	8.81 b-j	38.14 b-d	59.08 b-e	3.80 m-s	1.09 p-s	2.40 j-r
Dual Forage SCA	Dyna-Gro Seed	F	MF	N	8.95 b-j	31.76 r-u	49.01 t-u	4.12 c-o	16.31 a	2.49 f-n
NK300	Sorghum Partners	F	ME	N	9.23 a-g	33.77 k-r	53.11 k-p	4.05 e-p	7.75 f-h	2.43 h-q
SP3905 BD BMR	Sorghum Partners	F	ME	Y	9.24 a-g	31.81 q-u	50.89 p-t	3.31 u-w	6.76 f-i	2.74 a-d
SS405	Sorghum Partners	F	L	N	7.74 j-m	37.14 c-g	57.74 c-g	4.44 b-e	2.66 m-s	2.17 s-x
NK300	Sorghum Partners	F	ME	N	6.72 m	33.80 k-q	51.65 n-t	4.06 d-p	11.93 c-e	2.25 q-w
SP3904 BD BMR	Sorghum Partners	F	ML	Y	9.03 b-i	35.96 e-j	56.20 f-j	3.36 s-w	2.32 n-s	2.64 b-g
SP4105	Sorghum Partners	F	E	Y	9.36 a-e	38.61 a-c	57.75 c-g	3.63 p-v	0.10 s	2.35 l-t
Sordan Headless	Sorghum Partners	F	E	N	8.24 e-k	40.34 a	60.17 a-c	4.72 a-b	0.28 s	2.01 x
SP3905 BD BMR	Sorghum Partners	F	ME	Y	8.12 f-l	31.17 s-u	50.34 q-u	3.88 j-r	12.35 c-d	2.60 c-i
OPAL (x033)	Mojo Seed	F	M	N	9.12 a-i	35.37 f-k	56.94 d-h	3.99 f-p	1.30 p-s	2.50 e-m
715X	Mojo Seed	F	M	N	9.15 a-h	34.68 i-n	55.13 g-k	3.93 h-r	4.42 h-p	2.48 f-o
713X	Mojo Seed	F	M	N	9.40 a-e	34.67 i-n	53.96 i-n	4.11 c-o	5.93 g-m	2.45 g-q
714X	Mojo Seed	F	M	N	9.27 a-g	34.12 j-p	53.64 j-o	4.30 b-j	6.62 f-k	2.51 e-m
XF251	Richardson Seed-5	F	E	N	8.21 e-k	33.74 k-r	52.41 l-s	3.77 b-j	6.67 f-j	2.51 e-m
XF382	Richardson Seed-7	F	E	Y	7.94 h-m	33.80 k-q	53.51 j-p	3.53 q-w	4.97 h-o	2.62 b-h
XF254	Richardson Seed-8	F	L	Y	9.78 a-b	36.95 c-g	57.24 d-h	3.72 o-u	0.66 q-s	2.50 e-n
XF255	Richardson Seed-9	F	L	N	9.40 a-e	36.78 c-g	56.55 d-i	3.84 l-r	0.83 q-s	2.41 i-q

Table 3. continued.

Hybrid Information[1]					Nutrient Composition & Calculations[2]					
Hybrid	**Company**	**Type**	**Maturity**	**BMR**	**% Crude Protein**	**% ADF**	**% NDF**	**% Lignin**	**% Starch**	**% Fat**
XF260	Richardson Seed-10	F	L	N	8.82 b-j	37.20 b-g	57.70 c-g	4.38 b-g	2.47 m-s	2.32 m-u
18096	Gayland Ward Seed-1	F	M		9.35 a-f	33.66 k-r	52.91 k-q	4.17 c-n	6.72 f-j	2.57 d-j
20249	Gayland Ward Seed-2	F	M		7.25 k-m	33.44 k-r	53.89 i-n	3.91 i-r	7.06 f-i	2.55 d-l
18153	Gayland Ward Seed-2	F	M		7.92 h-m	32.56 q-u	50.29 q-u	3.80 m-s	8.64 e-g	2.62 b-h
19156	Gayland Ward Seed-2	F	M		6.93 l-m	34.62 i-o	52.75 k-r	3.86 k-r	9.56 d-f	2.30 n-v
19040	Gayland Ward Seed-3	F	L		10.34 a	36.52 d-i	58.61 c-f	4.96 a	0.10 s	2.10 w-x
19042	Gayland Ward Seed-3	F	L		8.09 g-l	32.86 m-t	52.78 k-r	3.93 h-r	3.81 i-r	2.70 a-e
19181	Gayland Ward Seed-3	F	L		8.98 b-i	30.65 u	51.51 n-t	3.20 v-w	3.25 j-s	2.83 a
19038	Gayland Ward Seed-4	F	L		8.28 e-k	32.07 p-u	52.14 m-s	3.91 i-r	6.70 f-j	2.81 a-b
20163	Gayland Ward Seed-4	F	L		8.67 b-j	33.59 k-r	53.67 j-o	4.13 c-o	6.25 f-l	2.44 g-q
19179	Gayland Ward Seed-4	F	L		9.54 a-d	31.99 p-u	52.06 m-s	3.84 k-r	6.25 f-l	2.55 d-l
X52265	Scott Seed	F	ML	N	9.27 a-g	36.22 d-i	55.97 f-j	4.15 c-o	3.99 i-q	2.27 q-w
X52053	Scott Seed	F	ML	N	9.61 a-d	37.01 c-g	57.10 d-h	4.28 c-k	1.29 p-s	2.16 t-x
X50315	Scott Seed	F	ML	N	9.37 a-e	31.96 p-u	50.15 r-u	4.22 c-m	12.82 b-d	2.44 g-q
X50654	Scott Seed	F	PS	Y	9.58 a-d	37.33 b-f	56.44 e-i	3.33 t-w	0.58 q-s	2.38 j-r
X50651	Scott Seed	F	M	Y	9.58 a-d	35.18 g-l	55.11 g-l	3.53 q-w	2.94 l-s	2.50 e-m
X54243	Scott Seed	F	L	Y	7.99 h-l	38.79 a-c	62.34 a	4.25 c-l	0.14 s	2.20 r-x
X53554	Scott Seed	F	PS	N	8.54 c-j	39.23 a-b	60.21 a-c	4.18 c-n	0.10 s	2.13 u-x
Means					**8.88**	**35.11**	**54.72**	**3.91**	**5.09**	**2.45**
CV					**14.02**	**5.86**	**5.02**	**11.34**	**69.19**	**8.16**
Location										
Davis					**6.41 c**	**36.96 a**	**50.84 c**	**4.07 b**	**6.13 a**	**2.27 c**
KARE1					**9.05 b**	**33.58 d**	**52.37 b**	**3.83 c**	**5.69 a**	**2.44 b**
KARE2					**10.16 a**	**35.90 b**	**54.06 a**	**4.22 a**	**4.67 b**	**2.42 b**
WREC					**9.87 a**	**34.20 c**	**51.70 b**	**3.52 d**	**3.81 c**	**2.66 a**

[1]Hybrid information provided by seed companies. Under type, F=Forage sorghum. Under Maturity, 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=0.05)

Table 3. 2020 comparisons of sorghum forage hybrids and locations for the nutritional characteristic's NFC. ESC Sugar, and WSC Sugar at KARE1, KARE2, WREC, and Davis by seed company.

Hybrid Information[1]					Nutrient Composition & Calculations[2]		
Hybrid	**Company**	**Type**	**Maturity**	**BMR**	**NFC**	**ESC Sugar**	**WSC Sugar**
F70FS91 BMR	Dyna-Gro Seed	F	E	Y	23.37 l-r	2.28 g-m	9.02 b-c
F71FS72 BMR	Dyna-Gro Seed	F	E	Y	29.90 c-f	2.89 b-h	9.18 b-c
F72FS05	Dyna-Gro Seed	F	ME	N	25.02 i-m	1.99 j-n	7.77 c-j
Super Sile 30	Dyna-Gro Seed	F	ME	N	22.63 n-r	1.81 l-n	8.91 b-d
F72FS25 BMR	Dyna-Gro Seed	F	M	Y	23.70 k-p	3.09 a-b	8.15 c-h
F74FS23 BMR	Dyna-Gro Seed	F	M	Y	26.48 g-l	2.69 b-j	8.90 b-d
F74FS72 BMR	Dyna-Gro Seed	F	ML	Y	23.51 k-q	2.94 a-g	8.38 c-h
Super Sile 20	Dyna-Gro Seed	F	ML	N	24.15 j-p	1.92 k-n	8.36 c-h
TopTon	Dyna-Gro Seed	F	L	N	23.17 m-r	2.20 h-m	8.38 c-h
Dual Forage SCA	Dyna-Gro Seed	F	ML	N	33.41 a-b	1.75 m-n	3.48 n-o
Danny Boy II BMR	Dyna-Gro Seed	F	PS	Y	20.19 r-s	2.86 b-i	8.63 c-f
First Graze	Dyna-Gro Seed	F	ME	N	33.89 a	2.74 b-i	6.08 k-l
Super Sweet 10	Dyna-Gro Seed	F	ME	N	33.01 a-c	2.47 b-l	5.99 k-m
Dynagraze II	Dyna-Gro Seed	F	ME	N	33.33 a-b	2.62 b-k	5.37 l-m
Fullgraze II	Dyna-Gro Seed	F	ML	N	22.45 n-r	1.92 k-n	8.52 c-f
Fullgraze II BMR	Dyna-Gro Seed	F	ML	Y	21.19 p-s	2.51 b-l	8.27 c-h
Dual Forage SCA	Dyna-Gro Seed	F	MF	N	32.48 a-c	1.37 n	3.07 o
NK300	Sorghum Partners	F	ME	N	27.97 e-i	2.36 c-m	6.64 i-l
SP3905 BD BMR	Sorghum Partners	F	ME	Y	30.53 b-e	3.02 a-e	8.70 b-e
SS405	Sorghum Partners	F	L	N	24.64 j-o	2.14 i-m	8.49 c-f
NK300	Sorghum Partners	F	ME	N	29.26 d-g	2.19 h-m	6.42 j-l
SP3904 BD BMR	Sorghum Partners	F	ML	Y	23.01 m-r	2.83 b-i	8.63 c-f
SP4105	Sorghum Partners	F	E	Y	18.07 s	2.38 c-m	8.42 c-g
Sordan Headless	Sorghum Partners	F	E	N	20.44 q-s	2.00 j-n	7.72 c-j
SP3905 BD BMR	Sorghum Partners	F	ME	Y	31.33 a-d	3.02 a-f	6.60 i-l
OPAL (x033)	Mojo Seed	F	M	N	24.21 j-p	2.33 d-m	8.90 b-d
715X	Mojo Seed	F	M	N	25.96 h-m	2.49 b-l	7.25 e-k
713X	Mojo Seed	F	M	N	26.70 f-k	2.70 b-j	6.93 h-k
714X	Mojo Seed	F	M	N	27.33 e-j	2.93 a-g	6.39 j-l
XF251	Richardson Seed-5	F	E	N	28.79 d-h	2.32 e-m	8.05 c-i
XF382	Richardson Seed-7	F	E	Y	28.15 d-i	2.28 g-m	8.87 b-d
XF254	Richardson Seed-8	F	L	Y	22.65 n-r	2.29 g-m	8.16 c-h
XF255	Richardson Seed-9	F	L	N	23.50 k-q	2.23 g-m	8.29 c-h
XF260	Richardson Seed-10	F	L	N	23.27 l-r	2.50 b-l	7.20 f-k
18096	Gayland Ward Seed-1	F	M		27.89 e-i	2.68 b-j	6.96 g-k
20249	Gayland Ward Seed-2	F	M		27.89 e-i	2.73 b-i	7.82 c-j

Table 3. continued.

Hybrid Information[1]					Nutrient Composition & Calculations[2]		
Hybrid	**Company**	**Type**	**Maturity**	**BMR**	**NFC**	**ESC Sugar**	**WSC Sugar**
18153	Gayland Ward Seed-2	F	M		29.85 c-f	3.03 a-d	8.02 c-i
19156	Gayland Ward Seed-2	F	M		29.25 d-g	2.36 c-m	7.31 e-k
19040	Gayland Ward Seed-3	F	L		22.13 n-r	2.25 g-m	8.88 b-d
19042	Gayland Ward Seed-3	F	L		29.92 c-e	2.60 b-k	10.12 a-b
19181	Gayland Ward Seed-3	F	L		29.20 d-g	3.14 a-b	11.12 a
19038	Gayland Ward Seed-4	F	L		30.23 b-e	3.07 a-c	8.35 c-h
20163	Gayland Ward Seed-4	F	L		27.93 e-i	3.07 a-c	8.01 c-i
19179	Gayland Ward Seed-4	F	L		28.42 d-h	3.63 a	7.74 c-j
X52265	Scott Seed	F	ML	N	24.55 j-o	2.28 g-m	7.55 d-j
X52053	Scott Seed	F	ML	N	23.07 m-r	1.96 k-n	8.31 c-h
X50315	Scott Seed	F	ML	N	31.34 a-d	1.95 k-n	4.54 m-n
X50654	Scott Seed	F	PS	Y	21.60 o-r	2.15 i-m	8.06 c-i
X50651	Scott Seed	F	M	Y	24.12 j-p	2.30 f-m	8.21 c-h
X54243	Scott Seed	F	L	Y	21.52 o-r	2.00 j-n	8.42 c-g
X53554	Scott Seed	F	PS	N	20.20 r-s	1.89 l-n	8.38 c-h
Means					**26.14**	**2.43**	**7.69**
CV					**12.41**	**29.73**	**19.29**
Location							
Davis					**26.29 b**	**1.91 c**	**7.90 b**
KARE1					**27.75 a**	**2.81 a**	**8.36 a**
KARE2					**23.98 c**	**2.80 a**	**6.86 d**
WREC					**26.32 b**	**2.14 b**	**7.55 c**

[1]Hybrid information provided by seed companies. Under type, F=Forage sorghum, D=Dual Forage/grain sorghum. Under Maturity, E=Early, F=Full, ME=Medium Early, MF=medium Full, M=Medium, ML=Medium Late, L=Late, PS=Photoperiod Sensitive.

[2]Means followed by the same letter do not significantly differ using LSD (P=0.05)

Table 3. 2020 comparisons of sorghum forage hybrids and locations for the nutritional characteristic's NDFd30, NDFd240, uNDFom240, Milk lbs ton^{-1}, and RFQ at KARE1, KARE2, WREC, and Davis by seed company.

Hybrid Information[1]					Nutrient Composition & Calculations[2]				
Hybrid	**Company**	**Type**	**Maturity**	**BMR**	**NDFd30**	**NDFd240**	**uNDFom240**	**Milk Lbs ton-1**	**RFQ**
F70FS91 BMR	Dyna-Gro Seed	F	E	Y	58.04 c-g	73.69 b-i	14.05 h-t	2375.34 l-t	108.95 e-k
F71FS72 BMR	Dyna-Gro Seed	F	E	Y	55.19 h-n	71.74 g-o	13.61 m-u	2648.22 a-e	120.67 a-c
F72FS05	Dyna-Gro Seed	F	ME	N	53.15 m-s	71.39 i-p	15.50 b-f	2400.23 h-s	99.22 l-r
Super Sile 30	Dyna-Gro Seed	F	ME	N	54.72 i-p	72.80 e-l	15.44 b-g	2327.37 o-t	97.39 o-s
F72FS25 BMR	Dyna-Gro Seed	F	M	Y	59.57 a-d	75.81 a-c	12.52 u	2396.66 h-s	114.98 b-g
F74FS23 BMR	Dyna-Gro Seed	F	M	Y	56.79 e-i	72.83 e-l	13.61 m-u	2452.85 f-q	115.92 b-e
F74FS72 BMR	Dyna-Gro Seed	F	ML	Y	60.05 a-d	75.66 a-d	12.78 s-u	2383.95 i-t	114.34 b-g
Super Sile 20	Dyna-Gro Seed	F	ML	N	52.18 r-u	70.55 l-r	16.37 b	2284.65 r-u	93.65 r-s
TopTon	Dyna-Gro Seed	F	L	N	54.67 i-q	72.19 f-n	15.23 b-i	2272.87 r-u	98.42 n-s
Dual Forage SCA	Dyna-Gro Seed	F	ML	N	50.34 u-v	68.57 r-t	14.12 g-s	2759.10 a	124.19 a
Danny Boy II BMR	Dyna-Gro Seed	F	PS	Y	58.93 b-e	73.93 a-h	13.93 i-t	2129.07 u-v	103.95 i-p
First Graze	Dyna-Gro Seed	F	ME	N	47.97 v-w	67.03 s-u	15.77 b-d	2748.83 a	113.52 c-h
Super Sweet 10	Dyna-Gro Seed	F	ME	N	47.33 w	66.29 t-u	16.18 b-c	2688.87 a-d	110.15 d-k
Dynagraze II	Dyna-Gro Seed	F	ME	N	47.88 v-w	65.99 u	16.33 b-c	2752.85 a	113.50 c-h
Fullgraze II	Dyna-Gro Seed	F	ML	N	52.53 o-u	69.98 n-r	17.94 a	2357.70 m-t	90.72 s
Fullgraze II BMR	Dyna-Gro Seed	F	ML	Y	56.86 e-i	72.61 e-m	15.49 b-f	2240.63 s-u	99.05 m-r
Dual Forage SCA	Dyna-Gro Seed	F	MF	N	50.63 t-u	69.16 p-s	14.32 f-r	2702.68 a-b	120.44 a-c
NK300	Sorghum Partners	F	ME	N	52.90 n-t	70.54 l-r	14.82 d-m	2529.33 d-l	109.26 e-k
SP3905 BD BMR	Sorghum Partners	F	ME	Y	56.03 f-k	72.74 e-m	13.25 o-u	2742.38 a	125.30 a
SS405	Sorghum Partners	F	L	N	52.21 q-u	70.69 k-r	16.24 b-c	2328.78 o-t	95.37 q-s
NK300	Sorghum Partners	F	ME	N	50.08 u-v	68.93 q-s	14.99 c-l	2319.63 p-t	102.86 j-q
SP3904 BD BMR	Sorghum Partners	F	ML	Y	58.85 b-e	74.64 a-e	13.69 k-u	2379.84 k-t	111.30 d-i
SP4105	Sorghum Partners	F	E	Y	60.87 a-b	76.05 a-b	13.07 p-u	2021.70 v	102.95 j-q
Sordan Headless	Sorghum Partners	F	E	N	54.69 i-p	72.82 e-l	15.73 b-e	2144.53 u-v	92.38 r-s
SP3905 BD BMR	Sorghum Partners	F	ME	Y	54.19 j-r	72.34 e-n	13.21 o-u	2690.53 a-c	122.19 a-b
OPAL (x033)	Mojo Seed	F	M	N	54.79 i-o	72.04 f-n	15.12 b-j	2414.96 h-r	102.93 j-q
715X	Mojo Seed	F	M	N	53.80 j-s	72.02 f-n	14.69 d-n	2473.57 f-p	105.61 h-n
713X	Mojo Seed	F	M	N	54.03 j-r	72.16 f-n	14.38 e-p	2529.68 c-l	110.19 d-k
714X	Mojo Seed	F	M	N	51.75 r-u	70.37 m-r	15.03 b-k	2473.10 f-p	104.69 i-o
XF251	Richardson Seed-5	F	E	N	53.20 l-s	71.27 j-q	14.31 f-r	2513.07 e-m	110.57 d-j
XF382	Richardson Seed-7	F	E	Y	56.20 f-j	73.43 c-j	13.52 n-u	2552.06 b-h	114.40 b-g
XF254	Richardson Seed-8	F	L	Y	60.40 a-c	76.19 a	12.99 r-u	2481.07 f-o	114.56 b-g
XF255	Richardson Seed-9	F	L	N	57.03 e-i	74.14 a-g	13.85 j-u	2400.32 h-s	107.47 f-k

Table 3. continued.

Hybrid Information[1]					Nutrient Composition & Calculations[2]				
Hybrid	**Company**	**Type**	**Maturity**	**BMR**	**NDFd30**	**NDFd240**	**uNDFom240**	**Milk Lbs ton-1**	**RFQ**
XF260	Richardson Seed-10	F	L	N	53.95 j-r	72.10 f-n	15.28 b-h	2315.78 p-t	98.18 n-s
18096	Gayland Ward Seed-1	F	M		52.88 n-t	71.06 j-q	14.49 d-o	2537.66 c-k	110.14 d-k
20249	Gayland Ward Seed-2	F	M		55.65 f-l	73.42 c-j	13.45 n-u	2468.44 f-q	110.72 d-j
18153	Gayland Ward Seed-2	F	M		54.00 j-r	71.64 h-o	13.36 n-u	2476.07 f-p	115.26 b-f
19156	Gayland Ward Seed-2	F	M		52.32 p-u	69.51 o-r	15.30 b-h	2451.03 f-q	107.09 g-m
19040	Gayland Ward Seed-3	F	L		54.03 j-r	72.65 e-m	15.16 b-j	2327.56 o-t	96.05 p-s
19042	Gayland Ward Seed-3	F	L		52.42 o-u	71.72 h-o	14.00 h-t	2543.69 b-i	108.04 e-k
19181	Gayland Ward Seed-3	F	L		55.57 g-m	72.99 e-k	13.00 q-u	2576.24 b-g	117.70 a-d
19038	Gayland Ward Seed-4	F	L		53.81 j-s	72.11 f-n	13.65 l-u	2604.03 a-f	113.72 c-h
20163	Gayland Ward Seed-4	F	L		52.86 n-t	71.48 i-p	14.45 d-o	2501.52 e-n	107.29 f-l
19179	Gayland Ward Seed-4	F	L		53.68 k-s	72.82 e-l	13.36 n-u	2542.61 b-j	112.12 d-i
X52265	Scott Seed	F	ML	N	55.14 i-n	72.73 e-m	14.43 d-o	2382.22 j-t	104.13 i-p
X52053	Scott Seed	F	ML	N	55.53 h-m	73.28 d-j	14.46 d-o	2348.51 n-t	102.34 k-q
X50315	Scott Seed	F	ML	N	51.39 s-u	69.95 n-r	14.34 f-q	2703.03 a-b	117.66 a-d
X50654	Scott Seed	F	PS	Y	61.45 a	76.24 a	12.73 t-u	2317.76 p-t	113.55 c-h
X50651	Scott Seed	F	M	Y	58.10 c-f	74.13 a-g	13.55 m-u	2424.16 g-r	111.91 d-i
X54243	Scott Seed	F	L	Y	53.49 l-s	70.47 l-r	17.81 a	2308.83 q-t	90.55 s
X53554	Scott Seed	F	PS	N	57.64 d-h	74.40 a-f	14.80 d-m	2235.01 t-u	99.14 l-r
Means CV									
					54.75 4.56	**72.06 3.37**	**14.52 9.36**	**2461.64 6.61**	**108.71 7.59**
Location									
Davis					**51.14 c**	**69.53 c**	**15.49 a**	**2140.00 c**	**94.91 c**
KARE1					**56.93 a**	**74.02 a**	**13.52 b**	**2666.69 a**	**117.58 a**
KARE2					**56.59 a**	**74.28 a**	**13.81 b**	**2487.88 b**	**109.84 b**
WREC					**54.04 b**	**70.16 b**	**15.40 a**	**2524.64 b**	**111.31 b**

[1]Hybrid information provided by seed companies. Under type, F=Forage sorghum, D=Dual Forage/grain sorghum. Under Maturity, E=Early, F=Full, ME=Medium Early, MF=medium Full, M=Medium, ML=Medium Late, L=Late, PS=Photoperiod Sensitive.

[2]Means followed by the same letter do not significantly differ using LSD (P=0.05)

Table 4. Top 10 hybrids in the 2020 UC Sorghum Forage Trials based on yield and lodging[1].

Hybrid	Company	Type	Maturity	BMR	% Lodging	Ton acre-[1] 65% Moist	% Crude Protein	240 hr NDFd	Milk Lbs ton-1	RFQ
19042	Gayland Ward Seed-3	F	L		0.00	21.67	8.09	71.72	2543.69	108.04
NK300	Sorghum Partners	F	ME	N	6.67	20.16	6.72	68.93	2319.63	102.86
20163	Gayland Ward Seed-4	F	L		0.00	18.17	8.67	71.48	2501.52	107.29
F72FS05	Dyna-Gro Seed	F	ME	N	5.83	18.04	8.66	71.39	2400.23	99.22
SP3904 BD BMR	Sorghum Partners	F	ML	Y	8.75	17.97	9.03	74.64	2379.84	111.30
XF260	Richardson Seed-10	F	L	N	4.17	17.78	8.82	72.10	2315.78	98.18
714X	Mojo Seed	F	M	N	9.17	17.48	9.27	70.37	2473.10	104.69
Dual Forage SCA	Dyna-Gro Seed	F	ML	N	0.00	16.87	9.57	68.57	2759.10	124.19
X50315	Scott Seed	F	ML	N	6.25	16.70	9.37	69.95	2703.03	117.66
X52053	Scott Seed	F	ML	N	0.00	16.24	9.61	73.28	2348.51	102.34

[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 16.0 tons acre^{-1} averaged over the UC Forage Trials in 2020.

Hybrid	Company	Type	Maturity	BMR	% Lodging	Ton acre^{-1} 65% Moist	240 hr NDFd	Milk Lbs ton-1	RFQ
19042	Gayland Ward Seed-3	F	L		0.00	21.67	8.09	71.7	2543.69
Fullgraze II	Dyna-Gro Seed	F	ML	N	30.42	21.39	7.97	70.0	2357.70
NK300	Sorghum Partners	F	ME	N	6.67	20.16	6.72	68.9	2319.63
X54243	Scott Seed	F	L	Y	43.75	19.17	7.99	70.5	2308.83
XF255	Richardson Seed-9	F	L	N	22.00	18.72	9.40	74.1	2400.32
SS405	Sorghum Partners	F	L	N	36.67	18.63	7.74	70.7	2328.78
20163	Gayland Ward Seed-4	F	L		0.00	18.17	8.67	71.5	2501.52
XF254	Richardson Seed-8	F	L	Y	12.27	18.08	9.78	76.2	2481.07
First Graze	Dyna-Gro Seed	F	ME	N	33.33	18.07	8.06	67.0	2748.83
F72FS05	Dyna-Gro Seed	F	ME	N	5.83	18.04	8.66	71.4	2400.23
Super Sile 20	Dyna-Gro Seed	F	ML	N	27.08	18.02	7.83	70.6	2284.65
SP3904 BD BMR	Sorghum Partners	F	ML	Y	8.75	17.97	9.03	74.6	2379.84
XF260	Richardson Seed-10	F	L	N	4.17	17.78	8.82	72.1	2315.78
Dual Forage SCA	Dyna-Gro Seed	F	MF	N	17.50	17.76	8.95	69.2	2702.68
714X	Mojo Seed	F	M	N	9.17	17.48	9.27	70.4	2473.10
Dynagraze II	Dyna-Gro Seed	F	ME	N	45.00	16.91	8.69	66.0	2752.85
Dual Forage SCA	Dyna-Gro Seed	F	ML	N	0.00	16.87	9.57	68.6	2759.10
Sordan Headless	Sorghum Partners	F	E	N	19.17	16.82	8.24	72.8	2144.53
TopTon	Dyna-Gro Seed	F	L	N	30.83	16.78	8.19	72.2	2272.87
Super Sweet 10	Dyna-Gro Seed	F	ME	N	47.50	16.75	8.40	66.3	2688.87
X50315	Scott Seed	F	ML	N	6.25	16.70	9.37	70.0	2703.03
F72FS25 BMR	Dyna-Gro Seed	F	M	Y	10.00	16.28	9.76	75.8	2396.66
X52053	Scott Seed	F	ML	N	0.00	16.24	9.61	73.3	2348.51
19038	Gayland Ward Seed-4	F	L		0.00	16.18	8.28	72.1	2604.03
715X	Mojo Seed	F	M	N	0.00	16.13	9.15	72.2	2473.57
X52265	Scott Seed	F	ML	N	0.00	16.13	9.27	72.7	2382.22
F74FS72 BMR	Dyna-Gro Seed	F	ML	Y	8.33	16.05	9.26	75.7	2383.95

[1]Hybrid information provided by seed companies. Under type, F=Forage sorghum. Under Maturity, E=Early, F=Full, ME=Medium Early, MF=medium Full, M=Medium, ML=Medium Late, L=Late, PS=Photoperiod Sensitive.