



2020 Texas A&M AgriLife Bushland Forage Sorghum Silage Trial

Jourdan Bell, Carla Naylor, Kevin Heflin,

Preston Sirmon, Nick Porter, Ronnie Schnell, and Katrina Horn

The 2020 Texas A&M AgriLife Research and Extension Forage Sorghum Silage Trial consisted of 71 sorghum hybrids including forage sorghums, sorghum-sudangrasses, and grain sorghum hybrids. Evaluated hybrids included brown midrib and brachytic variants (Table 1). Two grain sorghum hybrids (DKS 37-07 and P84G62) serve as long-term grain production checks. Grain yields are requested by companies at the time of entry. Requested grain yields are reported to the USDA Farm Service Agency to annually update the Loan Deficiency Payment tables for forage sorghum hybrids. Corn checks provide a comparison between the forage production potential in a water limited production environment (Table 2).

The summer cropping season was marked by hot, dry, and windy conditions as well as a September cold front (low 35°F). Lower than average yields were a function of compounded environmental stress, which resulted in reduced biomass production and poor grain development. In-season precipitation totaled 6.24 inches. There was not any precipitation after September 9 (Fig. 1). The average forage yield was 18.2 tons/acre with yields ranging from 25.3 to 12.3 tons/acre (65% Moisture). Although sorghum is a heat tolerant crop that can withstand temperatures as high as 104°F (Peacock, 1982), the crop water demand increases with elevated temperatures. **In 2020, a limited crop water supply (soil moisture, precipitation, and irrigation) compounded plant physiological responses to heat stress resulting in curling leaves, poor panicle exertion, stunted height, and reduced biomass production in some hybrids. Cold temperatures on September 9 further impacted sorghum grain development. It has been previously documented that temperatures below 40 °F reduce pollen viability and the number of grains per panicle.** The September 9 cold front resulted in temperatures less than 40°F for 19 hours with the low temperature reaching 35°F when early hybrids were at the milk stage and later hybrids were at vegetative, heading, and bloom stages. As a result, pollination was variable for hybrids that bloomed after early September (Fig. 2). Because grain yield can be a significant component of forage tonnage, yields for many hybrids were reduced because of poor pollination. The 2020 starch levels are also an indication of lower grain yields. During grain fill, assimilated carbohydrates are translocated to the developing grain and converted to starch. If grain does not develop, starch levels will remain low. The impact of the 2020 season is evident when comparing starch concentrations between the 2019 and 2020 trials. In 2019, the average starch concentration for sorghum hybrids was 15.1%. In comparison, the

average starch concentration for sorghum hybrids in the 2020 trial was 8.6% with values ranging from 0.1 to 27.6% (Table 3).

The trial was located near Bushland, TX under center pivot irrigation within a production forage sorghum field that was irrigated at approximately 50% ET (evapotranspiration demand of the crop). Seed companies submitted forage sorghum hybrids on a per fee basis except for the grain sorghum checks and corn hybrids. Extended windy conditions in early June 2020 delayed planting.

Agronomic Information

Cooperator: Michael Menke

Previous Crop: Wheat hay

Planting Date: June 18, 2020

Plot size: Four, 30-inch rows by 25 ft. (30ft planted)

Forage Sorghum Seeding Rate: 75,000 seeds/acre

Corn Silage Seeding Rate: 32,000 seeds/acre

Herbicide: Pre-plant application of Bicep (Atrazine + S-metolachlor) 1.5 pts/acre

Post-emergent application Facet-L (quinclorac) 2.0 pts/acre

Fertilizer: 215 lbs. N/acre as 46-0-0 preplant

Insecticide: 1 aerial application of Sivanto on August 15, 2020 (6 oz/ac at 3 GPA)

In-season Irrigation: 9.5 inches from planting to 9/24 for early hybrids

10.3 inches from planting to 9/28 for medium, late, and PS hybrids

In-season precipitation: 6.24 inches

Hybrids were blocked according to their marketed maturity class so that forages within each block could be mechanically harvested for yield when grain reached soft dough. Planting date, water stress, and latitude can affect the duration of the vegetative phase resulting in forages deviating from the marketed hybrid maturity. Hybrids that reached soft-dough before the average stage of the predefined maturity block were harvested by hand. Consequently, forage yields were obtained from a 25 ft² area (1 row by 10 ft.) for Dyna Gro's Dynagraz II and F75FS13 plots on October 1, 2020. In all other plots, the center 2 rows were mechanically chopped (sample size: 2 rows by 25 feet).

Photoperiod sensitive hybrids were all harvested on the last sampling date (October 16, 2020).

Uniform sub-samples were collected for dry matter and nutritional composition from all plots. A sub-sample of the chopped forage was dried at 221°F (105°C) to determine harvest moisture. All reported yields are corrected to 65% moisture. A 600-gram sample was submitted to Dairyland Laboratories, Arcadia, WI via Servi-Tech Laboratory, Amarillo, TX for forage nutritional analyses using near infrared reflectance spectroscopy (NIR). Forage constituents are reported on a dry matter (DM) basis (Table 3). Sugarcane aphids (SCA) were identified on August 7, 2020. All plots were scouted for SCA infestation upon initial identification. In response to infestation, the entire field including our test plots was sprayed

on August 15, 2020. Due to the timely insecticide application, there was no significant damage from SCAs in the 2020 trial.

Grain yield was collected on October 19 following forage harvest for select hybrids. Statistical analyses were completed for sorghum hybrids using SAS 9.4. Adjusted least significant differences for multiple comparisons were determined using Tukey's HSD. Effects and comparisons were determined significant at the 0.05 probability level. The discussion addresses broad averages for types of forage sorghums, grain sorghums evaluated as silage, and sorghum/sudangrass hybrids evaluated in the 2020 test. It is not recommended that hybrid selection be made based on marketed forage type. While the marketed forage types provide an indication of potential quality, actual quality parameters vary for hybrids of the same forage type, and there is often an overlap among hybrids in these type categories. Because forage quality requirements vary between livestock class and ration formulation, evaluated parameters provide a broad comparison of forage quality in the respective production environment.

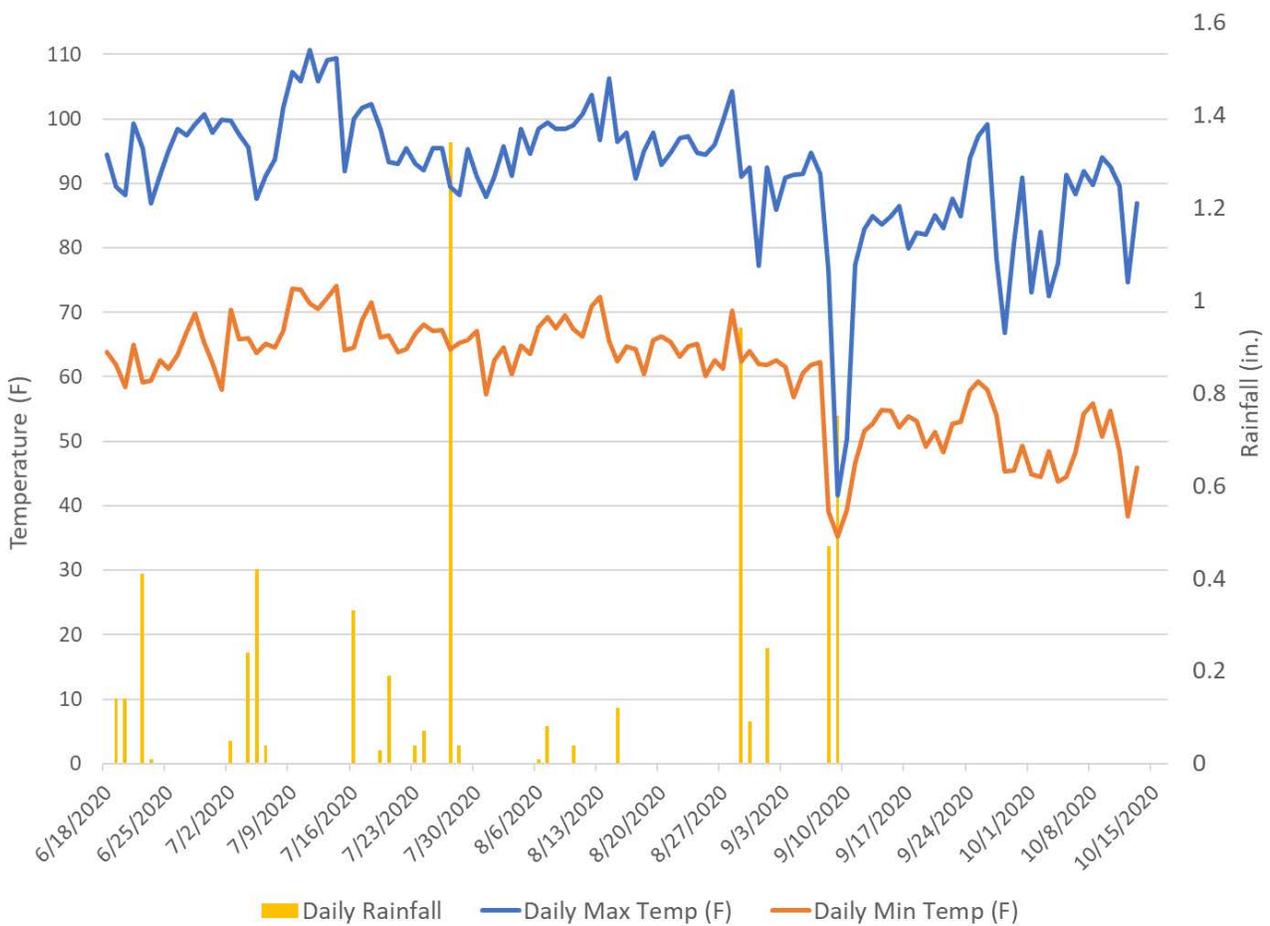


Figure 1. Daily temperatures and rainfall from panting to the final harvest.



Figure 2. Examples of varying pollination in the trial. All plots were evaluated for pollination with scored from 1 to 3 as represented by images from left to right. 1: $\geq 90\%$ pollination (Good), 2: 50-90% pollination (Fair), 3: $\leq 90\%$ pollination

Forage Nutritive Analyses Defined:

CP: Crude Protein

ADF: Acid Detergent Fiber; a fraction of the cell wall includes cellulose and lignin, which is inversely related to energy availability

aNDF: Neutral Detergent Fiber; cell wall fraction of the forage

NDFD: NDF digestibility; estimated fiber digestibility after the specified length of time (48 hrs.)

uNDFom: Undigested NDF after fermentation for the specified length of time (240 hrs.) expressed on an organic matter basis (om) in order to account for the ash

TDN: Total Digestible Nutrients (by Weiss equation) an index of energy concentration.

RFQ: Relative Forage Quality - an index for comparing forages, not just alfalfa. RFQ is based on the same scoring system as RFV with an average score of 100; higher scores indicate better feeding value

WSC: A measurement of simple sugars (glucose, fructose, and sucrose) and fructans. WSCs accumulate in the stalk until anthesis. After anthesis, they remobilize to the grain. WSCs are important for fermentation as they are used during the development of lactic acid

Milk/ton: An index based on several variables that influence intake and nutritive value. These are applied to a standard dairy cow to project milk produced per ton of forage.

Table 1. 2020 Summary of yield, lodging, and quality (DM basis) by forage type as reported at the time of entry. The number in parentheses represents the number of hybrids that make up each sorghum type.

Sorghum Type	Height at Harvest (in.)	% Lodging at Harvest	%Moisture at Harvest	Avg. Yield (tons/ac) 65% Moist.	% CP	% ADF	% aNDF	% Lignin	% Starch	% WSC	% NDFD48	% uNDF - om240	RFQ	TDN	Milk/ton
by Brown Midrib Trait															
BMR (34)	78	2.3	67.5	18.2	7.8	28.6	44.9	1.5	8.4	17.4	60.8	13.9	155.4	67.8	3386.4
Non-BMR (37)	75	4.1	67.4	18.2	7.9	30.1	46.8	2.3	8.7	16.2	58.1	15.2	140.9	65.9	3292.1
by Photoperiod Response															
Photoperiod Sensitive (6)	92	5.6	72.8	17.9	7.2	34.2	53.7	1.7	0.3	18.3	61.9	16.1	121.8	63.7	3001.4
Non-Photoperiod Sensitive (65)	75	3.0	66.9	17.9	7.9	28.9	45.2	2.0	9.3	16.6	59.2	14.4	150.3	67.1	3368.3
by Brachytic Trait															
Brachytic (21)	60	0.0	67.2	17.9	8.4	28.8	45.5	1.8	8.0	16.6	60.7	13.9	149.8	66.8	3336.8
Non-Brachytic (50)	84	4.5	67.6	18.2	7.7	29.6	46.1	2.0	8.8	16.8	58.9	14.8	147.0	66.8	3337.5
Test Average [†]	76	3.2	67.4	18.2	7.9	29.4	45.9	1.9	8.6	16.8	59.4	14.6	147.9	66.8	3337.3
Grain Sorghum and Corn Checks															
Grain Sorghum including Checks (6)	57	1.1	63.6	18.9	9.2	26.9	38.6	2.9	21.1	7.5	54.9	14.0	171.0	68.0	3584.7
Corn Checks (3) [‡]	84	0.0	60.7	17.7	9.9	26.7	37.6	2.2	13.8	14.2	53.0	13.9	175.0	70.2	3661.6

Table 2. 2020 Texas A&M AgriLife Bushland Forage Sorghum Silage Trial mean yield, days to half-bloom (HB), lodging, and harvest moisture listed by seed company. Male Sterile hybrids were pollinated by neighboring hybrids in the trial. FS=forage sorghum, SS=Sorghum Sudan, GS=Grain sorghum, E=Early, ME=Medium Early, M=Medium, ML=Medium Late, L=Late, and PS=Photoperiod Sensitive ^aPollination Scores 0: No head, 1: ≥90% pollination (Good), 2: 50-90% pollination (Fair), 3: ≤90% pollination (Poor). Hybrids that bloomed after the 9/10/2020 cold weather event did not fully pollinate.

Hybrid Characteristics								Days to Half-Bloom (HB), Pollination Score, Lodging, Harvest Date, Moisture, and Yield							
Entry	HYBRID	COMPANY	Sorghum Type	Advertised Maturity	BMR	Brach-ytic	Male Sterile	Days to HB ^b	Half Bloom Date	Pollination Score ^a	Harvest Date	Harvest Height (in)	% Lodge	% Moisture at Harvest	Yield (tons/ac) 65% Moisture
1	NUTRI-CHOMF	Bayer	FS	ML	Yes	No	Yes	97	9/23/2020	3	10/16/2020	102	2	70.7	14.2 ± 2.18 u-w
2	Qualimax	Bayer	SS	ML	No	No	No	95	9/21/2020	3	10/16/2020	114	0	69.2	16.8 ± 0.61 l-u
3	F72FS05	Dyna-Gro Seed	FS	ME	No	No	No	97	9/23/2020	3	10/15/2020	68	0	63.9	24.5 ± 6.43 ab
4	Super Sile 30	Dyna-Gro Seed	FS	ME	No	No	No	86	9/12/2020	3	10/15/2020	91	10	68.0	18.9 ± 2.93 c-q
5	F75FS13	Dyna-Gro Seed	FS	M	No	No	No	65	8/21/2020	1	10/1/2020	94	7	66.5	21.8 ± 3.14 a-f
6	F72FS25 BMR	Dyna-Gro Seed	FS	M	Yes	Yes	No	90	9/15/2020	2	10/15/2020	60	0	65.1	18.4 ± 1.64 e-s
7	F74FS23 BMR	Dyna-Gro Seed	FS	M	Yes	No	No	84	9/9/2020	2	10/15/2020	87	22	68.2	18.6 ± 1.62 d-r
8	F74FS72 BMR	Dyna-Gro Seed	FS	M	Yes	Yes	No	90	9/16/2020	2	10/15/2020	66	0	63.7	20.2 ± 2.31 c-k
9	Super Sile 20	Dyna-Gro Seed	FS	ML	No	No	No	92	9/18/2020	3	10/15/2020	87	3	70.5	19.5 ± 0.89 c-o
10	TopTon	Dyna-Gro Seed	FS	ML	No	No	No	90	9/15/2020	2	10/15/2020	96	15	69.7	19.4 ± 1.39 c-o
11	Danny Boy II BMR	Dyna-Gro Seed	SS	PS	Yes	No	No	.	.	0	10/16/2020	93	0	77.2	14.1 ± 1.74 u-w
12	First-Graze	Dyna-Gro Seed	SS	ME	No	No	No	60	8/17/2020	1	9/24/2020	85	5	68.1	16.6 ± 0.94 l-v
13	Super Sweet 10	Dyna-Gro Seed	SS	M	No	No	No	60	8/17/2020	1	9/24/2020	82	0	67.1	18.3 ± 2.24 f-s
14	Dynagraze II	Dyna-Gro Seed	SS	M	No	No	No	62	8/19/2020	1	10/1/2020	95	0	65.4	20.9 ± 1.72 b-h
15	Fullgraze II	Dyna-Gro Seed	SS	ML	No	No	No	101	9/27/2020	3	10/16/2020	108	3	69.5	14.7 ± 1.29 t-w
16	Fullgraze II BMR	Dyna-Gro Seed	SS	ML	Yes	No	No	116	10/12/2020	3	10/16/2020	103	3	73.0	15.6 ± 0.41 q-w
55	Dual Forage SCA	Dyna-Gro Seed	GS		No	No	No	67	8/24/2020	1	10/1/2020	55	0	58.4	18.6 ± 1.86 d-r
17	Silo 700D	Richardson Seeds	FS	ML	No	No	No	82	9/8/2020	3	10/1/2020	68	0	69.0	20.3 ± 2.28 c-j
18	Silo 700D BMR	Richardson Seeds	FS	ML	Yes	No	No	92	9/18/2020	2	10/1/2020	66	0	71.1	18.0 ± 3.38 g-t
19	Bundle King BMR	Richardson Seeds	FS	L	Yes	No	Yes	104	9/29/2020	3	10/16/2020	96	3	71.9	16.0 ± 0.49 o-v
20	9500W	Richardson Seeds	FS	E	No	Yes	No	69	8/26/2020	1	9/24/2020	54	0	69.0	17.6 ± 2.35 h-u
21	F431	Richardson Seeds	FS	E	Yes	Yes	No	67	8/24/2020	1	9/24/2020	51	0	70.1	16.5 ± 1.31 m-v
22	XF382	Richardson Seeds	FS	E	Yes	No	No	67	8/24/2020	1	9/24/2020	70	2	71.0	16.7 ± 0.65 l-v
23	XF251	Richardson Seeds	FS	E	No	No	No	67	8/24/2020	1	9/24/2020	74	10	70.2	18.6 ± 1.18 d-r
24	XF381	Richardson Seeds	FS	E	Yes	No	No	60	8/17/2020	1	9/24/2020	68	0	63.9	17.0 ± 1.75 k-u
25	XF255	Richardson Seeds	FS	ML	No	Yes	No	92	9/18/2020	3	10/16/2020	64	0	67.8	17.5 ± 2.15 h-u
26	XF254	Richardson Seeds	FS	ML	Yes	Yes	No	101	9/27/2020	3	10/16/2020	60	0	68.4	16.8 ± 0.98 l-u
27	XF260	Richardson Seeds	FS	ML	No	No	No	97	9/23/2020	3	10/16/2020	78	0	67.2	19.0 ± 1.36 c-q
28	Sweeter N Honey II	Richardson Seeds	SS	L	No	No	No	95	9/21/2020	3	10/16/2020	100	0	72.3	15.1 ± 1.75 r-w
29	Sweeter N Honey II BMR	Richardson Seeds	SS	L	Yes	No	No	99	9/25/2020	3	10/16/2020	100	0	70.7	16.9 ± 1.98 l-u
30	Sweeter N Honey BMR	Richardson Seeds	SS	ME	Yes	No	No	67	8/24/2020	1	9/24/2020	71	0	71.3	17.2 ± 1.04 i-u
31	S473	Richardson Seeds	SS	PS	Yes	No	No	.	.	0	10/16/2020	95	0	73.0	18.5 ± 1.76 e-r
32	X51423	Scott Seed	FS	L	Yes	No	No	95	9/21/2020	2	10/1/2020	82	0	70.5	24.4 ± 2.57 ab
33	X50665	Scott Seed	FS	L	Yes	Yes	No	90	9/15/2020	2	10/16/2020	54	0	65.8	17.9 ± 0.22 h-t
34	X52242	Scott Seed	FS	L	No	No	No	101	9/27/2020	3	10/16/2020	71	0	67.4	16.4 ± 2.26 n-v
35	X50654	Scott Seed	SS	PS	Yes	No	No	.	.	0	10/16/2020	81	0	71.4	25.3 ± 4.13 a
36	X50643	Scott Seed	SS	L	Yes	No	No	114	10/9/2020	3	10/16/2020	101	5	73.4	15.1 ± 2.31 r-w

Table 2 cont.

Hybrid Characteristics								Days to Half-Bloom (HB), Pollination Score, Lodging, Harvest Date, Moisture, and Yield							
Entry	HYBRID	COMPANY	Sorghym Type	Advertised Maturity	BMR	Brach- ytic	Male Sterile	Days to HB†	Half Bloom	Pollination Score ^a	Harvest Date	Harvest Height (in)	% Lodge	% Moisture at Harvest	Yield (tons/ac) 65% Moisture
37	X50651	Scott Seed	SS	M	Yes	Yes	No	90	9/15/2020	3	10/1/2020	64	0	69.9	17.2 ± 1.10 j-u
38	X54243	Scott Seed	SS	L	No	No	No	116	10/12/2020	3	10/16/2020	106	10	68.5	14.1 ± 0.91 u-w
39	X53554	Scott Seed	SS	PS	No	No	No	.	.	0	10/16/2020	90	27	70.8	12.3 ± 2.38 w
40	X52265	Scott Seed	FS	L	No	Yes	No	92	9/18/2020	2	10/16/2020	52	0	66.3	15.7 ± 1.02 p-w
41	X504223	Scott Seed	FS	L	Yes	No	No	101	9/27/2020	3	10/16/2020	86	25	70.3	19.0 ± 1.75 c-q
42	Mega Green	Walter Moss Seed	SS	PS	No	No	No	.	.	0	10/16/2020	107	7	71.6	14.5 ± 1.53 t-w
43	Mega Green BMR	Walter Moss Seed	SS	PS	Yes	No	No	.	.	0	10/16/2020	85	0	72.5	22.3 ± 1.91 abc
44	OPAL	MOJO Seed	FS	M	No	Yes	No	84	9/9/2020	2	10/1/2020	59	0	70.1	16.0 ± 1.57 o-v
45	x713	MOJO Seed	FS	ME	No	Yes	No	74	8/31/2020	2	10/1/2020	56	0	65.7	19.6 ± 2.14 c-n
46	x714	MOJO Seed	FS	ME	No	Yes	No	74	8/31/2020	2	10/1/2020	62	0	67.0	19.1 ± 2.90 c-q
47	x715	MOJO Seed	FS	ME	No	Yes	No	74	8/31/2020	2	10/1/2020	57	0	67.6	17.5 ± 0.93 h-u
48	x940	MOJO Seed	FS	ME	No	Yes	No	67	8/24/2020	1	10/1/2020	64	0	62.3	19.2 ± 2.03 c-p
49	31F65	Wilbur-Ellis	SS	M	Yes	Yes	No	82	9/8/2020	2	10/1/2020	73	0	68.8	18.1 ± 1.08 g-t
50	35F45	Wilbur-Ellis	FS	ME	Yes	Yes	No	69	8/26/2020	1	10/1/2020	63	0	65.0	20.4 ± 3.70 c-j
51	W7051	Warner Seeds	GS	E	No	No	No	67	8/24/2020	1	9/24/2020	64	0	68.0	19.9 ± 1.64 c-n
52	W7706-W	Warner Seeds	GS	E	No	No	No	67	8/24/2020	1	9/24/2020	66	0	68.0	19.8 ± 2.36 c-n
53	2-Way AT	Warner Seeds	FS	ML	No	No	No	87	9/13/2020	3	10/16/2020	85	0	67.3	22.1 ± 2.18 a-d
54	WXF17-37 (X)	Warner Seeds	FS	ML	No	No	No	90	9/15/2020	2	10/16/2020	105	57	68.0	17.2 ± 1.92 i-u
56	Gayland Ward	18116	SS	M	Yes	No	No	67	8/24/2020	1	10/16/2020	86	0	60.2	14.9 ± 2.80 s-w
57	Gayland Ward	18118	SS	E	No	No	Yes	67	8/24/2020	2	10/1/2020	83	0	66.1	17.0 ± 2.57 k-u
58	Gayland Ward	19038	SS	L	No	Yes	No	101	9/27/2020	3	10/16/2020	65	0	66.5	19.7 ± 3.66 c-n
59	Gayland Ward	19040	SS	L	No	Yes	No	87	9/13/2020	3	10/16/2020	51	0	67.3	13.1 ± 0.48 u-w
60	Gayland Ward	19042	SS	L	No	Yes	No	99	9/25/2020	3	10/16/2020	69	0	70.6	18.8 ± 1.19 d-q
61	Gayland Ward	19053	SS	E	Yes	No	Yes	65	8/21/2020	1	10/1/2020	83	0	66.3	17.0 ± 1.38 j-u
62	Gayland Ward	19155	SS	E	Yes	No	Yes	67	8/24/2020	1	10/1/2020	78	0	70.1	17.5 ± 2.03 h-u
63	Gayland Ward	19174	SS	M	Yes	No	No	74	8/31/2020	2	10/16/2020	73	13	60.1	19.6 ± 3.25 c-o
64	Gayland Ward	19175	SS	M	Yes	No	No	69	8/26/2020	1	10/16/2020	76	0	56.7	20.7 ± 1.77 c-i
65	Gayland Ward	19176	SS	M	Yes	No	No	74	8/31/2020	2	10/16/2020	72	2	58.4	19.8 ± 0.44 c-n
66	Gayland Ward	19177	SS	M	Yes	No	No	74	8/31/2020	2	10/16/2020	76	0	54.5	21.4 ± 3.70 b-g
67	Gayland Ward	19178	SS	M	Yes	No	No	74	8/31/2020	2	10/16/2020	76	0	56.2	21.9 ± 3.91 a-e
68	Gayland Ward	19179	SS	L	No	Yes	No	85	9/11/2020	3	10/16/2020	60	0	65.4	20.2 ± 3.90 c-l
69	Gayland Ward	19181	SS	L	Yes	Yes	No	92	9/18/2020	3	10/16/2020	57	0	68.0	16.4 ± 2.09 n-v
70	TAMU CHECK	DKS 37-07	GS		No	No	No	60	8/17/2020	1	9/24/2020	45	0	61.2	18.8 ± 1.11 c-q
71	TAMU CHECK	84G62	GS		No	No	No	60	8/17/2020	1	9/24/2020	47	0	62.3	20.0 ± 1.22 c-m
72	TAMU CHECK	P0339	Corn					.	.		10/16/2020	75	0	61.4	10.7 ± 1.16 -
73	TAMU CHECK	P1244	Corn					.	.		10/16/2020	81	0	61.0	11.6 ± 1.40 -
74	TAMU CHECK	DKC70-64	Corn					.	.		10/16/2020	78	0	63.4	12.7 ± 1.68 -
† Silking date reported for corn hybrids. If no HB date reported for a sorghum hybrid, it did not reach HB prior to the last harvest date. *Mean and statistical evaluation does not include corn hybrids. If forage characteristic information is missing, information was not provided by developer/company at the time of entry. Yield means with the same letter are not significantly different at the 0.05 probability level.														Mean	18.2
														LSD	3.59
														CV (%)	12.2
														p-val	<0.0001

Table 3. 2020 Summary of forage nutrient composition reported on a dry matter (DM) basis and calculated nutritional quality indices. Male sterile entries were pollinated by other hybrids. FS=forage sorghum, SS=Sorghum Sudan, GS=Grain sorghum

Hybrid Characteristics								Nutrient Composition and Calculations (DM basis)											Yield (tons/ac)	
Entry	Hybrid	Company	Sorghum Type	Advertised Maturity	BMR	Brachytic	Male Sterile	% CP	% ADF	% aNDF	% Lignin	% Starch	% WSC	% NDFD48	% uNDF - om240	RFQ	TDN	Milk/ton	65% Moisture	
1	NUTRI-CHOMP	Bayer	FS	ML	Yes	No	Yes	6.7	31.1	51.6	1.5	1.5	22.2	66.8	13.4	142.0	65.9	3265.3	14.2 ± 2.18	
2	Qualimax	Bayer	SS	ML	No	No	No	6.8	32.8	51.5	2.2	3.7	21.2	59.2	16.5	123.7	64.4	3121.7	16.8 ± 0.61	
3	F72FS05	Dyna-Gro Seed	FS	ME	No	No	No	7.6	30.5	48.9	2.1	7.3	16.3	59.4	15.5	131.7	64.9	3170.7	24.5 ± 6.43	
4	Super Sile 30	Dyna-Gro Seed	FS	ME	No	No	No	7.1	29.6	47.3	2.2	8.6	17.9	57.0	15.6	135.3	66.8	3314.7	18.9 ± 2.93	
5	F75FS13	Dyna-Gro Seed	FS	M	No	No	No	7.8	27.4	40.5	2.3	14.1	16.8	53.1	14.8	156.8	68.3	3462.3	21.8 ± 3.14	
6	F72FS25 BMR	Dyna-Gro Seed	FS	M	Yes	Yes	No	7.8	28.7	44.7	1.9	11.1	14.5	60.7	14.1	151.3	66.5	3345.3	18.4 ± 1.64	
7	F74FS23 BMR	Dyna-Gro Seed	FS	M	Yes	No	No	6.6	29.3	44.9	1.6	8.5	20.4	60.0	14.4	148.6	67.4	3330.7	18.6 ± 1.62	
8	F74FS72 BMR	Dyna-Gro Seed	FS	M	Yes	Yes	No	8.3	29.4	45.1	1.9	10.3	14.1	60.0	14.4	147.7	66.1	3291.3	20.2 ± 2.31	
9	Super Sile 20	Dyna-Gro Seed	FS	ML	No	No	No	6.6	29.9	47.8	2.2	7.0	20.9	58.4	15.4	135.6	66.3	3291.0	19.5 ± 0.89	
10	TopTon	Dyna-Gro Seed	FS	ML	No	No	No	6.7	31.7	49.9	2.7	6.6	19.6	59.9	15.7	131.8	64.3	3224.3	19.4 ± 1.39	
11	Danny Boy II BMR	Dyna-Gro Seed	SS	PS	Yes	No	No	6.8	33.3	48.7	0.6	0.2	21.3	58.7	16.1	126.6	66.5	3001.3	14.1 ± 1.74	
12	First-Graze	Dyna-Gro Seed	SS	ME	No	No	No	8.6	29.5	44.9	2.6	10.0	14.6	56.4	15.8	141.7	65.8	3321.0	16.6 ± 0.94	
13	Super Sweet 10	Dyna-Gro Seed	SS	M	No	No	No	8.5	30.9	45.4	3.2	11.6	13.3	54.2	16.3	137.1	65.1	3315.3	18.3 ± 2.24	
14	Dynagraze II	Dyna-Gro Seed	SS	M	No	No	No	7.7	33.1	47.8	3.5	10.2	14.5	55.4	16.7	126.2	62.7	3137.0	20.9 ± 1.72	
15	Fullgraze II	Dyna-Gro Seed	SS	ML	No	No	No	6.1	35.3	57.3	2.4	0.4	19.1	57.7	18.9	106.2	63.7	3031.0	14.7 ± 1.29	
16	Fullgraze II BMR	Dyna-Gro Seed	SS	ML	Yes	No	No	6.4	33.1	52.5	1.2	0.1	21.8	61.0	16.5	124.6	65.9	3101.3	15.6 ± 0.41	
55	Dual Forage SCA	Dyna-Gro Seed	GS	O	No	No	No	8.6	29.1	40.9	3.5	21.5	4.8	53.8	15.2	154.2	65.7	3443.3	18.6 ± 1.86	
17	Silo 700D	Richardson Seeds	FS	ML	No	No	No	8.4	30.8	48.6	2.4	4.8	18.4	63.2	13.7	142.5	64.5	3265.7	20.3 ± 2.28	
18	Silo 700D BMR	Richardson Seeds	FS	ML	Yes	No	No	7.9	28.6	47.9	1.2	1.8	21.2	65.3	12.8	151.7	67.8	3383.0	18.0 ± 3.38	
19	Bundle King BMR	Richardson Seeds	FS	L	Yes	No	Yes	6.7	29.6	49.4	1.2	1.5	23.4	65.5	13.2	147.2	67.6	3351.3	16.0 ± 0.49	
20	9500W	Richardson Seeds	FS	E	No	Yes	No	9.3	28.7	43.3	2.7	11.5	14.0	58.3	14.4	152.5	65.6	3355.0	17.6 ± 2.35	
21	F431	Richardson Seeds	FS	E	Yes	Yes	No	10.0	25.2	39.9	1.7	13.2	13.8	61.8	12.3	180.1	69.2	3609.0	16.5 ± 1.31	
22	XF382	Richardson Seeds	FS	E	Yes	No	No	8.1	25.0	39.5	1.1	10.5	19.1	61.6	12.1	181.3	71.0	3656.0	16.7 ± 0.65	
23	XF251	Richardson Seeds	FS	E	No	No	No	8.3	26.5	41.7	1.7	9.9	18.8	59.1	13.3	163.0	68.8	3497.3	18.6 ± 1.18	
24	XF381	Richardson Seeds	FS	E	Yes	No	No	8.6	25.2	38.7	2.5	20.5	10.1	58.3	13.2	181.7	70.1	3785.3	17.0 ± 1.75	
25	XF255	Richardson Seeds	FS	ML	No	Yes	No	8.0	31.5	50.6	2.2	4.1	18.3	63.7	14.1	135.9	64.0	3165.0	17.5 ± 2.15	
26	XF254	Richardson Seeds	FS	ML	Yes	Yes	No	7.9	32.0	53.2	2.0	1.9	18.6	68.3	12.9	139.3	63.7	3174.7	16.8 ± 0.98	
27	XF260	Richardson Seeds	FS	ML	No	No	No	7.9	31.0	50.7	2.3	4.9	17.8	60.5	15.5	129.0	64.5	3168.7	19.0 ± 1.36	
28	Sweetee N Honey II	Richardson Seeds	SS	L	No	No	No	6.7	32.3	50.9	2.2	3.1	21.3	57.7	16.7	122.0	64.7	3125.7	15.1 ± 1.75	
29	Sweetee N Honey II BMR	Richardson Seeds	SS	L	Yes	No	No	6.2	33.4	55.0	2.4	0.7	21.8	65.8	14.8	129.5	63.0	3137.0	16.9 ± 1.98	
30	Sweetee N Honey BMR	Richardson Seeds	SS	ME	Yes	No	No	8.8	26.9	42.1	1.6	10.9	14.3	60.9	13.3	166.1	69.3	3556.0	17.2 ± 1.04	
31	S473	Richardson Seeds	SS	PS	Yes	No	No	6.8	34.3	54.6	1.7	0.1	17.4	64.0	15.2	125.9	64.3	3105.3	18.5 ± 1.76	
32	X51423	Scott Seed	FS	L	Yes	No	No	7.8	26.4	41.5	0.7	6.3	23.3	61.8	12.4	166.8	70.3	3439.3	24.4 ± 2.57	
33	X50665	Scott Seed	FS	L	Yes	Yes	No	8.3	28.4	46.6	1.5	9.9	14.2	63.3	13.5	150.2	66.8	3339.3	17.9 ± 0.22	
34	X52242	Scott Seed	FS	L	No	No	No	7.3	30.8	50.5	1.8	4.3	18.6	62.2	14.5	134.4	65.5	3217.3	16.4 ± 2.26	
35	X50654	Scott Seed	SS	PS	Yes	No	No	7.9	33.4	52.0	1.3	0.2	17.8	63.6	15.0	128.8	64.3	3018.7	25.3 ± 4.13	
36	X50643	Scott Seed	SS	L	Yes	No	No	6.7	31.8	51.1	1.3	1.8	21.4	61.8	15.9	131.2	66.3	3170.0	15.1 ± 2.31	
37	X50651	Scott Seed	SS	M	Yes	Yes	No	8.4	29.4	48.2	1.5	1.4	20.0	65.1	13.0	147.4	66.1	3276.0	17.2 ± 1.10	
38	X54243	Scott Seed	SS	L	No	No	No	5.9	35.1	55.6	2.1	0.6	18.9	55.4	19.4	105.4	64.7	3030.7	14.1 ± 0.91	
39	X53554	Scott Seed	SS	PS	No	No	No	7.2	34.2	56.3	2.3	0.1	18.8	62.6	16.4	117.1	62.3	2996.0	12.3 ± 2.38	
40	X52265	Scott Seed	FS	L	No	Yes	No	8.5	29.9	47.8	1.5	6.2	16.3	61.1	14.2	138.7	65.9	3204.0	15.7 ± 1.02	
41	X504223	Scott Seed	FS	L	Yes	No	No	6.9	26.2	40.2	0.5	7.9	23.2	59.6	12.7	169.5	71.3	3490.7	19.0 ± 1.75	
42	Mega Green	Walter Moss Seed	SS	PS	No	No	No	7.1	37.1	58.2	2.6	0.1	17.3	59.1	18.7	103.2	60.8	2825.0	14.5 ± 1.53	
43	Mega Green BMR	Walter Moss Seed	SS	PS	Yes	No	No	7.7	33.0	52.3	1.6	1.3	17.6	63.7	14.9	129.1	64.1	3062.0	22.3 ± 1.91	

Table 3 cont.

Hybrid Characteristics								Nutrient Composition and Calculations (DM basis)											Yield (tons/ac)		
Entry	Hybrid	Company	Sorghum Type	Advertised Maturity	BMR	Brach-ytic	Male Sterile	%CP	%ADF	%aNDF	%Lignin	%Starch	%WSC	%NDFD 48	%uNDF - om240	RFQ	TDN	Milk/ton	65% Moisture		
44	OPAL	MOJO Seed	FS	M	No	Yes	No	8.6	28.8	46.1	2.1	6.0	19.2	59.9	14.5	144.7	66.7	3343.3	16.0 ± 1.57		
45	x713	MOJO Seed	FS	ME	No	Yes	No	8.8	27.4	39.9	2.3	13.9	13.8	54.8	14.4	160.2	68.1	3459.3	19.6 ± 2.14		
46	x714	MOJO Seed	FS	ME	No	Yes	No	8.9	27.0	41.3	2.3	13.8	15.4	54.0	15.0	153.4	68.4	3477.7	19.1 ± 2.90		
47	x715	MOJO Seed	FS	ME	No	Yes	No	8.5	29.1	45.3	1.8	8.8	14.9	57.1	15.1	140.0	66.6	3263.3	17.5 ± 0.93		
48	x940	MOJO Seed	FS	ME	No	Yes	No	9.0	28.2	39.3	3.0	18.4	10.5	52.9	14.8	161.3	67.7	3527.3	19.2 ± 2.03		
49	31F65	Wilbur-Ellis	SS	M	Yes	Yes	No	8.2	29.5	46.9	1.4	2.6	20.1	63.2	13.5	147.1	66.3	3243.3	18.1 ± 1.08		
50	35F45	Wilbur-Ellis	FS	ME	Yes	Yes	No	7.8	25.7	38.0	1.5	14.3	15.4	58.3	12.8	178.9	69.8	3575.0	20.4 ± 3.70		
51	W7051	Warner Seeds	GS	E	No	No	No	9.4	24.2	36.7	2.5	21.8	9.1	56.0	12.9	187.2	70.4	3761.7	19.9 ± 1.64		
52	W7706-W	Warner Seeds	GS	E	No	No	No	8.9	26.5	39.8	1.9	15.3	12.5	57.1	13.8	166.3	68.6	3501.7	19.8 ± 2.36		
53	2-Way AT	Warner Seeds	FS	ML	No	No	No	7.1	29.8	47.5	2.1	6.4	20.0	58.9	14.9	137.2	66.2	3286.0	22.1 ± 2.18		
54	WXF17-37 (X)	Warner Seeds	FS	ML	No	No	No	6.8	31.8	49.7	2.5	5.1	19.8	58.1	16.1	128.5	65.0	3211.7	17.2 ± 1.92		
56	Gayland Ward	18116	SS	M	Yes	No	No	7.5	27.5	42.3	2.1	14.2	14.9	56.0	15.1	154.1	68.6	3501.3	14.9 ± 2.80		
57	Gayland Ward	18118	SS	E	No	No	Yes	7.6	29.2	44.2	1.6	7.0	18.5	59.9	14.2	150.0	67.0	3312.3	17.0 ± 2.57		
58	Gayland Ward	19038	SS	L	No	Yes	No	8.0	30.5	50.4	1.7	3.2	18.8	62.1	14.8	134.8	66.1	3245.3	19.7 ± 3.66		
59	Gayland Ward	19040	SS	L	No	Yes	No	8.7	29.6	48.3	1.6	3.9	17.8	63.1	13.8	142.9	66.2	3262.3	13.1 ± 0.48		
60	Gayland Ward	19042	SS	L	No	Yes	No	7.5	30.9	49.7	1.4	0.4	21.1	61.5	14.7	133.8	66.0	3175.3	18.8 ± 1.19		
61	Gayland Ward	19053	SS	E	Yes	No	Yes	8.0	27.2	40.3	1.6	11.7	17.3	56.0	14.3	161.1	68.5	3427.7	17.0 ± 1.38		
62	Gayland Ward	19155	SS	E	Yes	No	Yes	8.3	25.5	37.5	0.7	8.7	19.8	55.7	13.2	172.0	70.6	3441.0	17.5 ± 2.03		
63	Gayland Ward	19174	SS	M	Yes	No	No	8.7	24.6	37.9	1.7	19.9	11.3	56.7	13.0	190.7	71.3	3711.7	19.6 ± 3.25		
64	Gayland Ward	19175	SS	M	Yes	No	No	9.5	22.2	31.9	2.1	27.6	8.8	51.8	12.4	222.1	73.5	3935.7	20.7 ± 1.77		
65	Gayland Ward	19176	SS	M	Yes	No	No	8.4	27.2	41.1	2.7	20.4	8.4	52.5	15.6	155.4	69.0	3587.3	19.8 ± 0.44		
66	Gayland Ward	19177	SS	M	Yes	No	No	8.4	26.1	40.6	1.7	15.5	14.3	58.6	13.7	171.0	70.0	3612.3	21.4 ± 3.70		
67	Gayland Ward	19178	SS	M	Yes	No	No	8.6	26.8	41.1	1.9	17.5	11.1	56.9	14.3	161.9	69.4	3555.0	21.9 ± 3.91		
68	Gayland Ward	19179	SS	L	No	Yes	No	8.1	27.5	45.0	1.3	8.3	17.3	60.5	13.8	150.7	68.4	3394.7	20.2 ± 3.90		
69	Gayland Ward	19181	SS	L	Yes	Yes	No	8.1	27.9	45.7	0.7	3.8	21.2	64.0	12.8	154.4	68.8	3346.7	16.4 ± 2.09		
70	TAMU CHECK	DKS 37-07	GS	0	No	No	No	9.3	28.2	37.4	3.8	24.7	4.9	52.3	14.7	173.4	67.3	3610.0	18.8 ± 1.11		
71	TAMU CHECK	84G62	GS	0	No	No	No	9.6	26.5	38.3	3.0	22.3	6.0	55.5	13.6	173.9	67.9	3606.7	20.0 ± 1.22		
72	TAMU CHECK	P0339	Corn	0	0	0	0	10.1	25.8	36.0	2.5	17.1	13.0	51.5	13.9	182.9	70.7	3726.3	10.7 ± 1.16		
73	TAMU CHECK	P1244	Corn	0	0	0	0	10.0	25.8	36.8	2.1	16.0	13.1	55.4	13.1	186.2	70.7	3732.0	11.6 ± 1.40		
74	TAMU CHECK	DKC70-64	Corn	0	0	0	0	9.6	28.4	40.0	2.0	8.2	16.5	52.2	14.8	155.8	69.3	3526.3	12.7 ± 1.68		
Mean and statistical evaluations do not include corn hybrids. If forage characteristic information is missing, information was not provided by developer/company at the time of entry.								Mean	7.9	29.4	45.9	1.9	8.6	16.8	59.4	14.6	147.9	66.8	3337.3	18.2	
								LSD	0.8	2.7	4.7	0.8	6.0	3.3	3.9	22.0	2.8	199.6	3.59		
								CV (%)	6.2	5.6	6.5	25.6	42.6	12.2	4.1	5.4	9.1	2.6	3.7	12.2	
								p-val	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001

Table 4. 2020 Texas A&M AgriLife Bushland Forage Sorghum Silage Trial Grain Yields

Yields for all hybrids evaluated as a percent of the trial's long-term grain sorghum check Pioneer 84G62.

(2020 84G62 yield: 7,588 lbs/acre; 11 year average: 8,149 lbs/acre)

Entry Number	Company	Hybrid	Type	Maturity	BMR	Brachytic	Male Sterile	Half Bloom Date	Grain Yield (lb/ac) 13% GM	Grain Yield as a % of 2020 84G62 Grain Yield	Grain Yield as a % of 84G62 10-year Avg. Yield
20	Richardson Seeds	9500W	FS	E	No	Yes	No	8/26/2020	8655	114%	106%
55	Dyna-Gro Seed	Dual Forage SCA	GS		No	No	No	8/24/2020	8492	112%	104%
71	TAMU CHECK	84G62	GS		No	No	No	8/17/2020	7588	100%	93%
24	Richardson Seeds	XF381	FS	E	Yes	No	No	8/17/2020	6511	86%	80%
46	MOJO Seed	x714	FS	ME	No	Yes	No	8/31/2020	6367	84%	78%
70	TAMU CHECK	DKS 37-07	GS		No	No	No	8/17/2020	6030	79%	74%
63	Gayland Ward	19174	SS	M	Yes	No	No	8/31/2020	5568	73%	68%
67	Gayland Ward	19178	SS	M	Yes	No	No	8/31/2020	5415	71%	66%
17	Richardson Seeds	Silo 700D	FS	ML	No	No	No	9/8/2020	5126	68%	63%
65	Gayland Ward	19176	SS	M	Yes	No	No	8/31/2020	4789	63%	59%
56	Gayland Ward	18116	SS	M	Yes	No	No	8/24/2020	4347	57%	53%
47	MOJO Seed	x715	FS	ME	No	Yes	No	8/31/2020	4328	57%	53%
21	Richardson Seeds	F431	FS	E	Yes	Yes	No	8/24/2020	4318	57%	53%
48	MOJO Seed	x940	FS	ME	No	Yes	No	8/24/2020	4308	57%	53%
64	Gayland Ward	19175	SS	M	Yes	No	No	8/26/2020	4097	54%	50%
66	Gayland Ward	19177	SS	M	Yes	No	No	8/31/2020	4097	54%	50%
45	MOJO Seed	x713	FS	ME	No	Yes	No	8/31/2020	4007	53%	49%
33	Scott Seed	X50665	FS	L	Yes	Yes	No	9/15/2020	3395	45%	42%
44	MOJO Seed	OPAL	FS	M	No	Yes	No	9/9/2020	2972	39%	36%
23	Richardson Seeds	XF251	FS	E	No	No	No	8/24/2020	2962	39%	36%
22	Richardson Seeds	XF382	FS	E	Yes	No	No	8/24/2020	2779	37%	34%
40	Scott Seed	X52265	FS	L	No	Yes	No	9/18/2020	2414	32%	30%
32	Scott Seed	X51423	FS	L	Yes	No	No	9/21/2020	2366	31%	29%
58	Gayland Ward	19038	SS	Late	No	Yes	No	9/27/2020	1789	24%	22%