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2019 Sorghum Hybrid Performance Trials in Eastern Colorado

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2019 SORGHUM HYBRID PERFORMANCE TRIALS IN EASTERN COLORADO

SORGHUM HYBRID PERFORMANCE TRIALS IN EASTERN COLORADO, 2019

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This publication is a progress report of the sorghum hybrid performance trials conducted by the Department of Soil and Crop Sciences at Colorado State University, Colorado Agricultural Experiment Station (AES), and Colorado State University Extension. The grain sorghum trials were conducted at four sites in eastern Colorado: Akron, Seibert, Sheridan Lake and Walsh. Forage sorghum trials were conducted at Rocky Ford (irrigated) and at Walsh (dryland).

The 2019 Colorado grain sorghum crop is estimated at 15.60 million bushels, 9% lower than the 2018 sorghum crop of 17.23 million bushels. The 2019 sorghum crop is the fifth largest crop in the last 10 years. The fifth highest sorghum production this year was due to the fourth highest harvested acres, 325,000 acres, for the last 10 years. The grain yield this year was estimated at 48.0 bu/acre, which was the fifth highest average in the last 10 years. Sorghum silage statistics are not published during the current year; however, Colorado sorghum silage statistics are available for the previous year. In 2018, 112,000 tons of sorghum silage was produced, which is the fourth lowest sorghum silage production in a decade. The average yield was 14.0 tons/acre from 8,000 harvested acres. (USDA and National Agricultural Statistics Service, Colorado Field Office, 2019).

Tests are partially funded by entry fees paid by commercial firms. Commercial seed representatives interested in entering sorghum hybrids in any of the trials should contact Jerry Johnson, phone (970) 491-1454, email Jerry.Johnson@colostate.edu; or Kevin Larson, phone (719) 324-5643, email Kevin.Larson@colostate.edu for further details. Names and addresses of sorghum seed companies submitting entries in 2019 are shown in Table 1. Each firm selected entries for testing and furnished seed for the trials. AES researchers selected closed-pedigree hybrids as standards of comparison.

Summary tables for weather data (CoAgMet and NOAA, 2019), soil analysis (Soil, Plant and Water Testing Laboratory, Colorado State University), fertilization, and available soil water graphs derived from gypsum block readings are provided for certain trial locations. Other information, where available, was included: site description, irrigation, pest control, field history, and pertinent comments.

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Table 1.--Entrants in the 2019 Colorado Sorghum Performance Trials.

Brand	Entered by
ALTA SEEDS	Advanta US, 2001 E. 1st St., P.O. Box 2420, Hereford, TX 79045
GOLDEN ACRES	AgReliant Genetics, 1122 East 169th St., Westfield, IN 46074
BLUE RIVER ORGANIC SEED	Blue River Organic Seed, 2326 230th St., Ames, IA 50014
DEKALB	Bayer Crop Science, 800 N. Lindbergh Blvd., Creve Coeur, MO 63141
DYNA-GRO SEED	Crop Production Services, Inc., 3005 Rocky Mountain Ave, Loveland, CO 80538
GAYLAND WARD SEED	Gayland Ward Seed Co. Inc., 4395 US Hwy 60, Hereford, TX 79045
MOJO SEED	Mojo Seed, P.O. Box 1716, Hereford, TX 79045
PIONEER	Corteva Agriscience, P.O. Box 1000, Johnston, IA 50131
SORGHUM PARTNERS/ CHROMATIN	Chromatin,Inc., 1301 East 50th St., Lubbock, TX 79404
WARNER SEEDS	Warner Seeds, Inc., 120 South Lawton St., P.O. Box 1877, Hereford, TX 79045

Growing Degree Days for sorghum were calculated from planting through first freeze using a maximum of 111°F and a minimum of 50°F for threshold temperatures (Peacock and Heinrich, 1984). They are calculated by averaging daily high and low temperatures and subtracting the base temperature of 50°F from the average. When daily temperatures are less than 50°F, 50°F is used, when temperatures are above 111°F a maximum temperature of 111°F is used:

$$\frac{\text{(Daily Minimum Temp. + Daily Maximum Temp.)}}{2} - 50^{o}F$$

Experimental Methods and Evaluations

Trials at Walsh were planted with a four-row cone planter and harvested with a modified, self-propelled John Deere 4420 combine equipped with a four-row row-crop head to enhance harvest of lodged tillers. Trials at Akron, Seibert, and Sheridan Lake were planted with a four-row Seeds Research precision planter and harvested with a four-row Case 1620 combine modified as a multiple crop plot combine equipped with a Harvest Master weighing system. Forage sorghum was chopped using a single row John Deere 6 silage chopper at Walsh and a two-row New Holland 880 at Rocky Ford.

Days to Emergence. Seedling emergence was determined as the number of days after planting until approximately half of the seedlings became visible down a planted row.

50% Bloom. Number of days after planting until half of the main heads had pollinating florets. Number of days to half bloom provided a good measure of relative maturity between hybrids.

50% Maturity. Number of days after planting until half of the kernels in half of the main heads reached physiological maturity, i.e., the black layer became visible at the base of the kernel.

Plant Height. Plant height was measured in inches from the soil to the tip of the main head.

Lodging. The percentage of tillers with broken basal stems or broken peduncles or stems leaning more than a 45-degree angle were considered lodged. Since both combines were equipped with row crop heads, most of the leaning tillers were harvested.

Harvest Density. Plant population in plants per acre was measured after final stand and total harvestable tillers were measured prior to harvest.

Test Weight. Test weight are typically determined using a hand-held bushel weight tester at Walsh and recorded by a Harvest Master measuring system at Akron, Seibert

and Sheridan Lake. A low test weight indicates that a hybrid did not fully mature prior to the first freeze or that it suffered environmental stress, such as a water deficiency.

Grain Yield. The grain yield in bushels per acre was adjusted to 14 percent moisture content.

Yield as a % of Test Average. Yield as a percentage of test average provided a comparison among yields within a trial and allowed comparisons among years, irrespective of annual growing conditions.

Forage Yield. Forage yield in tons per acre was adjusted to 65% moisture content. A representative sample of fresh silage was oven-dried at 167^{o}F (75^{o}C) until there was no more weight loss, and then yields were adjusted to 65% moisture content.

Stem Sugar. The sugar content (Brix), expressed as a percent, in the stem of forage sorghums at harvest was measured with a hand refractometer.

Available Soil Water

Available soil water was measured by inserting gypsum blocks at 6, 18, 30, and 42 inches below the soil surface. Gypsum blocks were placed in one location near the middle of the second replication in a representative hybrid for each trial. Electrical resistance readings were made weekly or biweekly. Resistance readings varied with the amount of soil water present. Using resistance readings, available soil water was determined by extrapolating from soil water depletion curves for each soil type.

Statistical Method

Trials were planted in a randomized complete block design with four replications. No less than three replications were harvested. Analysis of variance was applied to the results and the least significant difference (LSD) was computed at alpha = 0.20 or 0.30 for all trials. Analysis of variance and regression were performed and with CoStat Statistical Software, a product of Cohort Software, Berkeley, California, and with SAS, SAS Institute, Cary, North Carolina.

Acknowledgements

We are appreciative to the staffs at the Central Great Plains Research Station at Akron, Arkansas Valley Research Center at Rocky Ford, and Plainsman Research Center at Walsh for their assistance in conducting these trials. We would like to extend a special thank you to Tim Stahlecker, grower-cooperator, for his assistance with the Seibert trial and Burl Scherler for his assistance with the Sheridan Lake trial.

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2019 Dryland Grain Sorghum Hybrid Performance Trial at Akron

Brand	Hybrid	Grain Yield[a]	Yield	Test Weight	Emerged Plant Population	Harvest Population[b]	Tillering[c]	Plant Height	50% Bloom	Lodging	Maturity Group[d]	Grain Color
		bu/ac	% of test avg.	lb/bu	plants/ac	heads/ac	heads/plant	in	days after planting	percent		
Dekalb	DKS29-28	**80.1**	146%	57.6	35,719	65,630	0.8	41	79	0	E	Bronze
Golden Acres	2620C	**79.6**	145%	57.1	31,218	72,019	1.3	52	82	29	ME	Cream
Dyna-Gro Seed	M60GB88	**77.3**	141%	57.4	33,396	60,403	0.8	49	81	8	ME	Bronze
Dekalb	DKS28-05	**76.4**	139%	57.6	31,508	71,438	1.3	50	78	19	E	Bronze
Dyna-Gro Seed	GX17912	**76.3**	139%	58.5	31,508	66,792	1.1	53	82	15	ME	Cream
Dyna-Gro Seed	GX18919	**76.2**	139%	57.6	31,799	58,370	0.8	47	77	58	E	Cream
Sorghum Partners	SP 31A15	**75.7**	138%	56.6	28,750	45,012	0.6	47	82	3	ME	Bronze
Dyna-Gro Seed	M54GR24	74.3	135%	59.2	33,251	72,600	1.2	44	76	15	E	Red
Dyna-Gro Seed	M59GB57	73.7	134%	58.1	29,766	57,209	0.9	44	76	8	E	Bronze
Golden Acres	2950B	71.0	129%	56.5	29,476	71,148	1.4	40	80	5	ME	Bronze
Golden Acres	2730B	69.7	127%	56.5	29,766	56,047	0.9	52	83	39	ME	Bronze
Sorghum Partners	SP 43M80	69.7	127%	58.5	32,234	49,658	0.5	51	82	5	ME	Bronze
Dyna-Gro Seed	M57GC29	68.8	126%	56.7	30,637	82,183	1.7	38	80	1	ME	Cream
Sorghum Partners	SP 25C10	67.8	124%	58.3	31,073	69,115	1.2	43	73	8	VE	Cream
Pioneer	87P06	66.8	122%	58.0	33,832	71,438	1.1	47	80	1	ME	Bronze
Dyna-Gro Seed	M59GB94	63.8	116%	56.8	29,330	54,305	0.9	54	85	46	M	Bronze
Dyna-Gro Seed	M57GB19	60.3	110%	57.8	33,251	55,466	0.7	51	83	25	ME	Bronze
Sorghum Partners	SP 33S40	59.7	109%	59.4	25,555	43,270	0.7	50	78	5	E	Cream
Dyna-Gro Seed	M62GB77	59.4	108%	56.8	30,347	47,916	0.6	53	86	1	M	Bronze
Gayland Ward Seed	19015	59.0	108%	57.4	29,911	49,949	0.7	50	87	0	M	Bronze
Gayland Ward Seed	18100	49.9	91%	56.2	26,281	56,918	1.2	48	88	0	M	Bronze
Gayland Ward Seed	18273	48.3	88%	52.6	29,621	56,338	0.9	51	92	30	M	Bronze
Gayland Ward Seed	18357	45.9	84%	55.6	20,183	49,658	1.5	49	88	1	M	Bronze
Gayland Ward Seed	18274	38.6	70%	52.0	25,846	49,949	0.9	48	90	1	M	Bronze
Gayland Ward Seed	18044	38.4	70%	49.0	28,169	40,946	0.5	53	92	0	M	Bronze
Gayland Ward Seed	18275	37.1	68%	52.1	25,700	44,431	0.7	48	91	0	M	Bronze
Dekalb	DKS33-07	33.1	60%	49.6	34,412	69,406	1.0	45	92	0	M	Bronze
Dyna-Gro Seed	M69GB38	29.3	53%	50.8	24,248	63,888	1.6	56	95	0	M	Bronze
Gayland Ward Seed	19014	27.9	51%	55.1	24,539	44,722	0.8	57	91	0	M	Bronze
Gayland Ward Seed	18057	26.2	48%	52.2	23,813	46,754	1.0	50	93	0	M	Bronze
Dyna-Gro Seed	M60GB31	24.5	45%	49.1	28,459	39,785	0.4	45	93	1	M	Bronze
Alta Seeds	ADV XG390IG	3.7	7%	46.3	23,958	39,494	0.6	47	106	0	L	Red
Alta Seeds	ADV XG009IG	1.0	2%	49.3	31,073	42,689	0.4	41	104	0	L	Red
Average		**54.8**		**55.2**	**29,352**	**56,514**	**0.9**	**48**	**85**	**10**		
[e]LSD (P<0.30)		5.4										

[a]Yields adjusted to 14% moisture and hybrids ranked by yield. Hybrid yields in bold are in the top LSD group.

[b]Total number of grain-producing heads/panicles taken at harvest, including tiller and main plant heads.

[c]Average number of productive (grain containing) tiller heads per plant. Does not include main plant head.

[d]Maturity group: VE=very early; E=early; ME=medium-early; M=medium; ML=medium-late; L=Late. Groupings are based on trial observations in addition to company provided data.

[e]If the difference between two varieties yields equals or exceeds the LSD value, there is a 70% chance the difference is significant.

Site Information

Collaborator:	USDA-ARS Central Great Plains Research Center
Planting Date:	June 3, 2019
Harvest Date:	October 26, 2019
Fertilizer:	Pre-plant: N at 45 lb/ac; Starter: 4.6 lb/ac of N and 10 lb/ac of Sulfur
Herbicide:	Pre-plant: Lumax EZ at 1.75 qt/ac, glyphosate at 1 qt/ac, and 2,4-D LV6 at 1 pt/ac applied May 24. Post-Emerge: Brawl at 1.33 pt/ac, Sterling Blue at 0.5 pt/ac, atrazine at 1 pt/ac applied June 24. Glyphosate at 0.5 qt/ac, Sterling Blue at 0.5 pt/ac with hooded sprayer between rows.
Soil Type:	Rago silt loam
Trial Comments:	Planted into moisture and heavy wheat stripper-header stubble, which caused slow seedling emergence. Trial received 0.5" rain within a week of planting. Consistent rain received throughout July and August, totaling about 3.4" in July and 2.3" in August. About 0.36" of rain received in September through harvest in October. Killing freeze occurred on Oct. 9th. Dispite herbicide program, there was a heavy infestation of pigweed on about 2% of the trial, and heavily infested plots were not used for data. Rest of the trial had light weed pressure. Some lodging noted at harvest. The two hybrids from Alta at the bottom of the table are new herbicide resistant hybrids that are not adapted to the Colorado growing environment.

2019 Dryland Grain Sorghum Hybrid Performance Trial at Seibert

Brand	Hybrid	Grain Yield[a]	Yield	Test Weight	Emerged Plant Population	Harvest Population[b]	Tillering[c]	Plant Height	50% Bloom	Maturity Group[d]	Grain Color
		bu/ac	% of test avg.	lb/bu	plants/ac	heads/ac	heads/plant	in	days after planting		
Golden Acres	2840B	**86.0**	119%	62.4	35,719	54,595	0.5	41	78	ME	Bronze
Dyna-Gro Seed	M60GB31	80.9	112%	60.0	33,396	43,560	0.3	42	80	ME	Bronze
Dyna-Gro Seed	M59GB94	80.6	111%	60.2	38,115	56,628	0.5	36	75	ME	Bronze
Dyna-Gro Seed	M62GB77	78.5	108%	60.9	39,930	49,949	0.3	38	82	M	Bronze
Dyna-Gro Seed	M69GB38	78.5	108%	60.7	32,452	42,979	0.3	41	79	ME	Bronze
Dyna-Gro Seed	GX18919	77.4	107%	60.1	38,333	60,403	0.6	42	78	ME	Cream
Dyna-Gro Seed	GX17912	77.2	107%	60.8	37,353	54,014	0.4	39	78	ME	Cream
Golden Acres	2620C	76.8	106%	60.6	34,630	54,595	0.6	36	74	E	Cream
Dekalb	DKS33-07	76.0	105%	59.2	38,877	54,305	0.4	40	83	M	Bronze
Pioneer	87P06	75.7	104%	60.3	45,738	-	-	34	74	E	Bronze
Dekalb	DKS29-28	74.5	103%	60.5	42,362	51,691	0.2	29	72	E	Bronze
Dyna-Gro Seed	M57GB19	73.2	101%	60.7	41,818	51,691	0.2	34	74	E	Bronze
Golden Acres	2730B	72.9	101%	60.8	40,656	48,206	0.2	41	74	E	Bronze
Sorghum Partners	SP 25C10	71.5	99%	60.4	40,946	62,726	0.5	33	74	E	Cream
Sorghum Partners	SP 33S40	70.5	97%	61.3	36,590	46,754	0.3	35	74	E	Cream
Dyna-Gro Seed	M59GB57	70.0	97%	60.1	34,195	56,338	0.6	33	72	E	Bronze
Sorghum Partners	SP 43M80	69.9	96%	61.3	40,511	47,626	0.2	35	79	ME	Bronze
Dyna-Gro Seed	M60GB88	69.9	96%	59.6	39,749	46,464	0.2	29	78	ME	Bronze
Dekalb	DKS28-05	67.5	93%	61.0	37,607	56,338	0.5	32	71	E	Bronze
Dyna-Gro Seed	M57GC29	66.5	92%	60.5	42,253	49,658	0.2	30	74	E	Cream
Sorghum Partners	SP 31A15	66.2	91%	59.8	32,343	45,012	0.4	30	73	E	Bronze
Dyna-Gro Seed	M54GR24	64.9	90%	61.3	43,850	69,406	0.6	33	71	E	Red
Alta Seeds	ADV XG390IG	63.3	87%	59.5	34,739	37,462	0.1	40	86	ML	Red
Gayland Ward Seed	18057	62.8	87%	60.7	28,024	33,106	0.2	47	71	E	Bronze
Alta Seeds	ADV XG009IG	61.2	84%	59.9	35,138	42,689	0.2	38	89	ML	Red
Average		**72.5**		**60.5**	**37,813**	**50,675**	**0.4**	**36**	**76**		
[e]LSD (P<0.30)		4.6									

[a]Yields adjusted to 14% moisture and hybrids ranked by yield. Hybrid yields in bold are in the top LSD group.

[b]Total number of grain-producing heads/panicles taken at harvest, including tiller and main plant heads.

[c]Average number of productive (grain containing) tiller heads per plant. Does not include main plant head.

[d]Maturity group: E=early; ME=medium-early; M=medium; ML=medium-late. Groupings are based on trial observations in addition to company provided

[e]If the difference between two varieties yields equals or exceeds the LSD value, there is a 70% chance the difference is significant.

Site Information

Collaborator:	Tim Stahlecker
Planting Date:	May 28, 2019
Harvest Date:	October 25, 2019
Fertilizer:	N at 50, P at 20, and Zn at 0.5 lb/ac
Herbicide:	Pre-Emerge: Cornerstone 5 Plus at 32 oz/ac, Charger Max at 16 oz/ac, and Atrazine 4 L at 16 oz/ac; Post-emerge: Huskie at 16 oz/ac, Atrazine at 16 oz/ac, and Dicamba at 6 oz/ac.
Soil Type:	Ascalon sandy loam
Trial Comments:	Planted into moisture, cool weather after planting caused slow seedling emergence. Trial received 0.7" rain within a week of planting. Consistent rain received throughout June, totaling about 3.1". July rainfall totaled 1" and there was 3.9" in August. September and October were dry with 0.32" of rain received in September through harvest in October. Killing freeze occurred on Oct. 10th. No lodging noted at harvest.

2019 Dryland Grain Sorghum Hybrid Performance Trial at Sheridan Lake

Brand	Hybrid	Grain Yield[a]	Yield	Test Weight	Emerged Plant Population	Harvest Population[b]	Tillering[c]	Plant Height	50% Bloom	Lodging	Maturity Group[d]	Grain Color
		bu/ac	% of test avg.	lb/bu	plants/ac	heads/ac	heads/plant	in	days after planting	percent		
Golden Acres	2840B	**120.3**	126%	61.1	23,377	62,436	1.7	57	65	20	ME	Bronze
Dekalb	DKS33-07	**115.8**	122%	59.2	24,394	82,474	2.4	51	68	0	M	Bronze
Pioneer	87P06	**114.4**	120%	60.1	27,443	81,022	2.0	45	57	0	E	Bronze
Sorghum Partners	SP 31A15	**114.2**	120%	56.0	23,813	60,113	1.5	50	65	0	ME	Bronze
Gayland Ward Seed	18057	107.2	113%	60.0	23,232	67,373	1.9	54	64	40	ME	Bronze
Dyna-Gro Seed	M60GB31	107.2	113%	60.1	22,361	71,438	2.2	52	66	98	M	Bronze
Dyna-Gro Seed	GX17912	106.6	112%	57.5	26,136	78,698	2.0	50	60	0	E	Cream
Warner Seed	W5911	105.6	111%	60.1	24,394	57,209	1.3	52	66	30	M	Bronze
Dyna-Gro Seed	M59GB94	105.5	111%	58.7	23,958	67,954	1.8	54	66	83	M	Bronze
Dyna-Gro Seed	M60GB88	105.3	111%	59.1	23,813	59,822	1.5	54	64	0	ME	Bronze
Dyna-Gro Seed	M54GR24	105.1	110%	59.8	24,394	66,792	1.7	48	59	0	E	Red
Dekalb	DKS29-28	102.5	108%	59.5	24,103	70,277	1.9	42	56	0	E	Bronze
Dyna-Gro Seed	M59GB57	100.4	106%	58.3	23,813	72,890	2.1	43	57	0	E	Bronze
Dekalb	DKS28-05	99.4	105%	58.9	25,991	70,858	1.7	52	57	0	E	Bronze
Sorghum Partners	SP 43M80	99.4	104%	60.5	25,991	67,954	1.6	52	60	68	E	Bronze
Dyna-Gro Seed	M57GB19	99.0	104%	59.6	25,700	72,600	1.8	54	61	0	ME	Bronze
Golden Acres	2730B	98.4	104%	58.9	22,651	73,181	2.2	58	63	33	ME	Bronze
Dyna-Gro Seed	M62GB77	98.4	103%	60.4	23,087	61,565	1.7	53	64	95	ME	Bronze
Dyna-Gro Seed	M57GC29	97.8	103%	58.8	25,410	80,441	2.2	42	66	0	M	Cream
Gayland Ward Seed	19014	96.8	102%	58.9	21,925	60,113	1.7	56	62	45	ME	Bronze
Golden Acres	2620C	96.7	102%	58.2	24,539	75,794	2.1	50	58	0	E	Cream
Dyna-Gro Seed	GX18919	95.2	100%	58.9	25,846	94,670	2.7	51	54	0	VE	Cream
Dyna-Gro Seed	M69GB38	94.4	99%	57.9	23,377	58,370	1.5	63	74	0	ML	Bronze
Sorghum Partners	SP 33S40	89.2	94%	59.6	22,651	67,082	2.0	55	61	0	ME	Cream
Sorghum Partners	SP 25C10	79.7	84%	59.7	21,635	68,825	2.2	44	55	0	VE	Cream
Warner Seed	W5501	76.5	80%	58.3	20,183	74,052	2.7	38	54	0	VE	Bronze
Warner Seed	W5711	72.4	76%	56.2	27,298	67,082	1.5	44	63	0	ME	Bronze
Warner Seed	W5506	67.5	71%	59.1	25,991	65,921	1.5	41	57	0	E	Red
Alta Seeds	ADV XG009IG	42.2	44%	53.0	21,925	54,886	1.5	50	88	0	L	Red
Alta Seeds	ADV XG390IG	39.8	42%	50.3	22,216	39,204	0.8	48	89	0	L	Red
Average		**95.1**		**58.5**	**24,055**	**68,370**	**1.8**	**50**	**63**	**17**		
[e]LSD (P<0.30)		7.9										

[a]Yields adjusted to 14% moisture and hybrids ranked by yield. Hybrid yields in bold are in the top LSD group.

[b]Total number of grain-producing heads/panicles taken at harvest, including tiller and main plant heads.

[c]Average number of productive (grain containing) tiller heads per plant. Does not include main plant head.

[d]Maturity group: VE=very early; E=early; ME=medium-early; M=medium; ML=medium-late; L=Late. Groupings are based on trial observations in addition to company provided data.

[e]If the difference between two varieties yields equals or exceeds the LSD value, there is a 70% chance the difference is significant.

Site Information

Collaborator:	Burl Scherler
Planting Date:	June 20, 2019
Harvest Date:	October 19, 2019
Fertilizer:	Pre-plant: N at 55 lb/ac and S at 10 lb/ac; Planting: N at 5, P at 16, and Zn at 0.5 lb/ac
Herbicide:	Pre-plant (fall '18): Flumioxazin at 2 oz/ac and atrazine at 1 lb/ac; Spring 2019: Flumioxazin at 1 oz/ac, and 2,4-D, glyphosate, and acetochlor at labeled rates.
Soil Type:	Olney sandy loam
Trial Comments:	Originally planted in late May but was sprayed out and replanted due to herbicide drift damage from adjacent field. Replanted into moisture and received ~0.5" of rain within two days. Consistent rain received throughout July and August, totaling about 3.5" in July (as 9 rain events) and 5.5" in August. About 0.75" of rain received in September through harvest in October. Killing freeze occurred on Oct. 6th. Upper leaves shredded from hail storm in early August, but no major damage. Some lodging noted at harvest.

2019 Dryland Grain Sorghum Hybrid Performance Trial at Walsh

Source	Hybrid	Grain Yield[a]	Yield	Test Weight	Plant Lodging	Plant Population[b]	Plant Height	50% Bloom	GDD[c]	50% Mature	Maturity Group[d]	Grain Color
		bu/ac	% of test avg.	lb/bu	%	plants/ac	in	days after planting		days after planting[e]		
Dyna-Gro Seed	M57GB19	**64.0**	124	59.7	2	35,600	38	65	2075	110	ME	Bronze
Dekalb	DKS29-28	**63.0**	122	60.1	0	32,500	34	62	1989	105	E	Bronze
Dyna-Gro Seed	M59GB94	**61.1**	118	60.1	5	36,000	38	67	2140	112	ME	Bronze
Dyna-Gro Seed	GX17912	59.4	115	59.8	0	31,400	36	64	2048	105	E	Cream
Dyna-Gro Seed	M62GB77	58.6	114	60.9	5	36,800	40	67	2140	113	ML	Bronze
Alta Seeds	AG1201	57.8	112	58.2	1	40,300	34	66	2106	108	ME	Bronze
Pioneer	86P20	57.7	112	59.6	1	38,000	38	61	1959	105	E	Bronze
Dyna-Gro Seed	M69GB38	57.6	112	59.2	2	33,700	42	75	2357	122	ML	Bronze
Sorghum Partners	SP68M57	57.5	111	59.4	7	28,700	43	69	2191	115	M	Bronze
Dekalb	DKS33-07	57.4	111	59.1	0	37,200	40	74	2325	121	ML	Bronze
Sorghum Partners	SP31A15	57.2	111	58.4	1	32,900	39	68	2165	112	ME	Bronze
Dekalb	DKS28-05	57.2	111	58.6	1	32,500	37	63	2023	106	E	Bronze
Sorghum Partners	SP43M80	56.9	110	60.1	9	36,000	42	67	2140	112	ME	Bronze
Dyna-Gro Seed	GX18919	56.0	109	59.3	1	34,100	37	59	1901	102	E	Cream
Alta Seeds	ADV G1150	55.1	107	59.7	4	29,000	39	67	2140	112	ME	Bronze
Alta Seeds	ADV G2106	54.5	106	59.2	4	32,100	39	67	2140	112	ME	Bronze
Dyna-Gro Seed	M60GB88	53.4	103	58.2	4	37,600	42	66	2106	108	ME	Bronze
Dyna-Gro Seed	M54GR24	52.8	102	59,2	0	38,000	37	65	2075	106	E	Red
Alta Seeds	ADV G1329	52.0	101	58.9	0	35,200	32	65	2075	108	ME	Cream
Sorghum Partners	SP25C10	51.4	100	59.4	0	39,900	37	58	1874	101	E	Cream
Alta Seeds	ADV XG9127	51.0	99	59.8	1	29,800	42	70	2216	114	M	Bronze
Dyna-Gro Seed	M59GB57	49.7	96	59.4	0	31,000	34	63	2023	106	E	Bronze
Dyna-Gro Seed	M57GC29	46.6	90	58.9	0	36,800	32	67	2140	112	ME	Cream
Dyna-Gro Seed	M60GB31	45.3	88	60.6	29	34,900	41	70	2216	116	ME	Bronze
Gayland Ward Seed	18057	44.5	86	58.7	3	41,800	46	70	2216	114	M	Bronze
Sorghum Partners	SP33S40	44.4	86	59.9	0	41,800	39	68	2165	112	ME	Cream
Advanta	ADV XG390IG	15.5	30	54.8	0	32,100	35	93	2846	SD	L	Red
Advanta	ADV XG009IG	7.3	14	52.7	0	39,900	35	98	2976	LM	L	Red
Average		**51.6**		**59.0**	**3**	**35,200**	**38**	**68**	**2170**	**110**	**ME**	
[f]LSD (P<0.20)		3.6			3							

[a]Yields adjusted to 14% moisture and hybrids ranked by yield. Hybrid yields in bold are in the top LSD group.

[b]Plant population taken after final stand. Main plants only, does not include tillers.

[c]GDD: Sorghum growing degree days to 50% bloom date.

[d]Maturity Group: E=early; ME=medium-early; M=medium; ML=medium late; L=late;

[e]Days after planting or seed maturation. LM=late milk; SD=soft dough.

[f]If the difference between two varieties yields equals or exceeds the LSD value, there is an 80% chance the difference is significant.

Site Information

Collaborator:	Plainsman Research Center (Kevin Larson & Brett Pettinger)
Planting Date:	June 6, 2019
Harvest Date:	November 14 and 15, 2019
Previous Crop:	Wheat
Herbicide:	Preemergence: Flumioxazin at 2.5 oz/ac; Atrazine at 1.0 lb/ac, Mesotrione at 6.4 oz/ac; and Metolachlor at 1.33 pts/ac; Post emergence: Huskie at 16 oz/ac, Atrazine at 0.75 lb/ac.
Fertilizer:	Anhydrous N at 50 lb/ac and 10-34-0 at 5 gal/ac was strip till applied.
Soil Type:	Richfield silt loam
Comments:	Planted into strip tilled wheat stubble. Rapid emergence and good stands. From planting (June 6) to July 2, the trial received 5.96 inches of rain. The rest of the growing season was dry, totaling 2.61 inches of rain from July 3 to October 11 (first freeze). Weed control was good, except for a moderate infestation of sandbur, which required cultivation. Some, mostly minor, lodging noted at harvest. The two hybrids from Alta at the bottom of the table are new herbicide resistant hybrids that are not adapted to the Colorado growing environment.

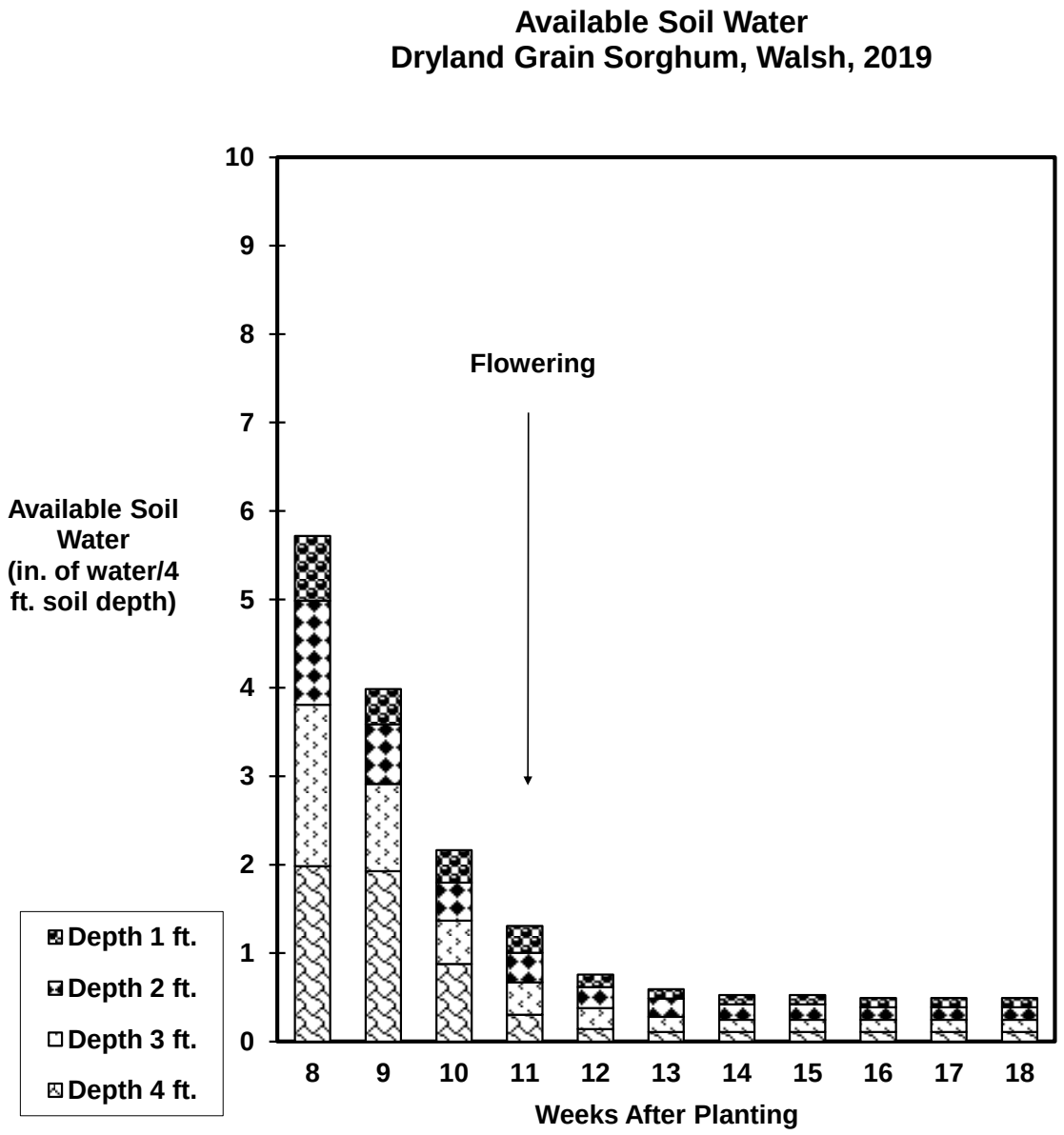

Fig. 1. Available soil water in dryland grain sorghum at Walsh. Gypsum block measurements taken to 4 ft. with 1 ft. increments. Total rainfall at Walsh from planting to first freeze was 8.54 in. Any increase in available soil water between weeks is from rain.

2019 Subsurface Drip Irrigated Grain Sorghum Hybrid Performance Trial at Walsh.

Source	Hybrid	Grain Yield[a]	Yield Percent of Trial Average	Test Weight	Plant Lodging	Plant Population[b]	Plant Height	50% Bloom	GDD[c]	50% Mature	Maturity Group[d]	Grain Color
		bu/ac	percent	lb/bu	%	plants/ac	in	days after planting		days after planting[e]		
Dekalb	DKS45-23	104.6	141	59.9	7	65,100	49	75	1839	120	ML	Bronze
Dekalb	DKS33-07	90.2	122	59.1	3	58,900	45	76	1873	121	ML	Bronze
Sorghum Partners	SP 43M90	86.8	117	56.7	18	57,300	48	66	1578	111	ME	Bronze
Alta Seeds	AG1201	85.3	115	58.1	3	56,500	39	67	1607	111	ME	Bronze
Dekalb	DKS38-16	84.7	114	60.3	1	55,800	48	72	1756	117	M	Bronze
Alta Seeds	ADV XG9127	83.7	113	57.1	1	50,000	44	77	1898	122	ML	Bronze
Dekalb	DKS47-07	81.0	109	57.9	8	49,600	48	76	1873	124	ML	Bronze
Warner Seed	W5911	80.1	108	59.3	4	60,400	43	71	1722	115	M	Bronze
Dekalb	DKS29-28	79.4	107	58.5	0	53,400	37	63	1493	108	E	Bronze
Gayland Ward Seed	18036	79.2	107	58.8	13	58,100	52	73	1781	119	ML	Bronze
Dyna-Gro Seed	M69GB38	78.6	106	60.0	3	50,300	44	78	1924	125	ML	Bronze
Dyna-Gro Seed	M59GB57	78.4	106	56.7	1	59,600	37	62	1472	108	E	Bronze
Gayland Ward Seed	18057	78.2	105	57.4	2	61,200	49	74	1808	119	ML	Bronze
Alta Seeds	ADV G2106	77.8	105	58.0	12	52,700	47	71	1722	116	M	Bronze
Golden Acres	2840B	77.3	104	58.4	26	60,800	43	66	1578	110	ME	Bronze
Warner Seed	W5506	74.2	100	57.4	4	59,200	40	61	1445	107	E	Bronze
Gayland Ward Seed	18094	74.2	100	56.7	3	59,200	50	75	1839	121	ML	Bronze
Dekalb	DKS29-05	73.6	99	58.0	2	53,700	39	61	1445	107	E	Bronze
Alta Seeds	ADV G1329	72.3	97	58.4	3	67,000	37	67	1607	113	ME	Cream
Gayland Ward Seed	18093	72.2	97	59.0	2	51,900	45	72	1756	116	M	Bronze
Golden Acres	2730B	71.6	96	57.9	10	67,000	39	65	1544	110	ME	Bronze
Warner Seed	W5711	69.5	94	57.7	1	53,100	37	66	1578	109	ME	Bronze
Gayland Ward Seed	18071	68.9	93	57.5	19	56,900	45	77	1898	125	ML	Bronze
Alta Seeds	ADV G1150	68.9	93	57.3	10	49,600	40	72	1756	116	M	Bronze
Sorghum Partners	SP 33S40	68.7	93	57.9	3	49,200	41	65	1544	109	ME	Cream
Dyna-Gro Seed	M62GB77	68.5	92	59.3	2	59,200	42	72	1756	116	M	Bronze
Sorghum Partners	SP 68M57	68.3	92	58.5	6	53,400	43	67	1607	111	ME	Bronze
Dyna-Gro Seed	M60GB88	68.1	92	58.4	7	59,600	46	66	1578	110	ME	Bronze
Gayland Ward Seed	19016	66.4	89	57.8	10	54,200	51	81	2006	127	L	Bronze
Golden Acres	3960B	64.0	86	59.1	16	55,800	40	71	1722	115	M	Bronze
Sorghum Partners	SP 31A15	63.7	86	56.7	3	58,100	41	65	1544	109	ME	Bronze
Dyna-Gro Seed	M60GB31	59.6	80	58.9	7	58,500	42	72	1756	115	M	Bronze
Warner Seed	W5501	55.5	75	56.0	3	43,000	34	62	1472	108	E	Bronze
Gayland Ward Seed	19017	43.7	59	52.0	9	50,000	51	87	2169	134	L	Bronze
Average		**74.0**		**58.0**	**7**	**56,100**	**43**	**70**	**1704**	**115**	**M**	
[f]LSD (P<0.20)		11.5			6.9							

[a]Yields adjusted to 14% moisture and hybrids ranked by yield.

[b]Plant population taken after final stand. Main plants only, does not include tillers.

[c]GDD: Sorghum growing degree days to 50% bloom date.

[d]Maturity Group: E=early; ME=medium-early; M=medium; ML=medium late.

[e]Days after planting or seed maturation.

[f]If the difference between two varieties yields equals or exceeds the LSD value, there is an 80% (at P<0.20) chance the difference is statistically significant.

Site Information

Collaborator:	Plainsman Research Center (Kevin Larson & Brett Pettinger)
Planting Date:	May 28, 2019
Harvest Date:	November 16 and 18, 2019
Previous Crop:	Wheat
Herbicide:	Preemergence: Flumioxazin at 2.5 oz/ac; Atrazine at 1.0 lb/ac, Mesotrione at 6.4 oz/ac; and Metolachlor at 1.33 pts/ac; Post emergence: Huskie at 16 oz/ac, Atrazine at 0.75 lb/ac.
Fertilizer:	Anhydrous N at 125 lb/ac and 10-34-0 at 7.5 gal/ac was strip till applied.
Soil Type:	Richfield silt loam
Comments:	Planted into strip tilled wheat stubble. Rapid emergence and good stands. From planting (May 28) to July 2, the trial received 6.65 inches of rain. The rest of the growing season was dry, totaling 2.61 inches of rain from July 3 to October 11 (first freeze). Weed control was good, except for a heavy infestation of sandbur, which required cultivation. Some, mostly minor, lodging noted at harvest.

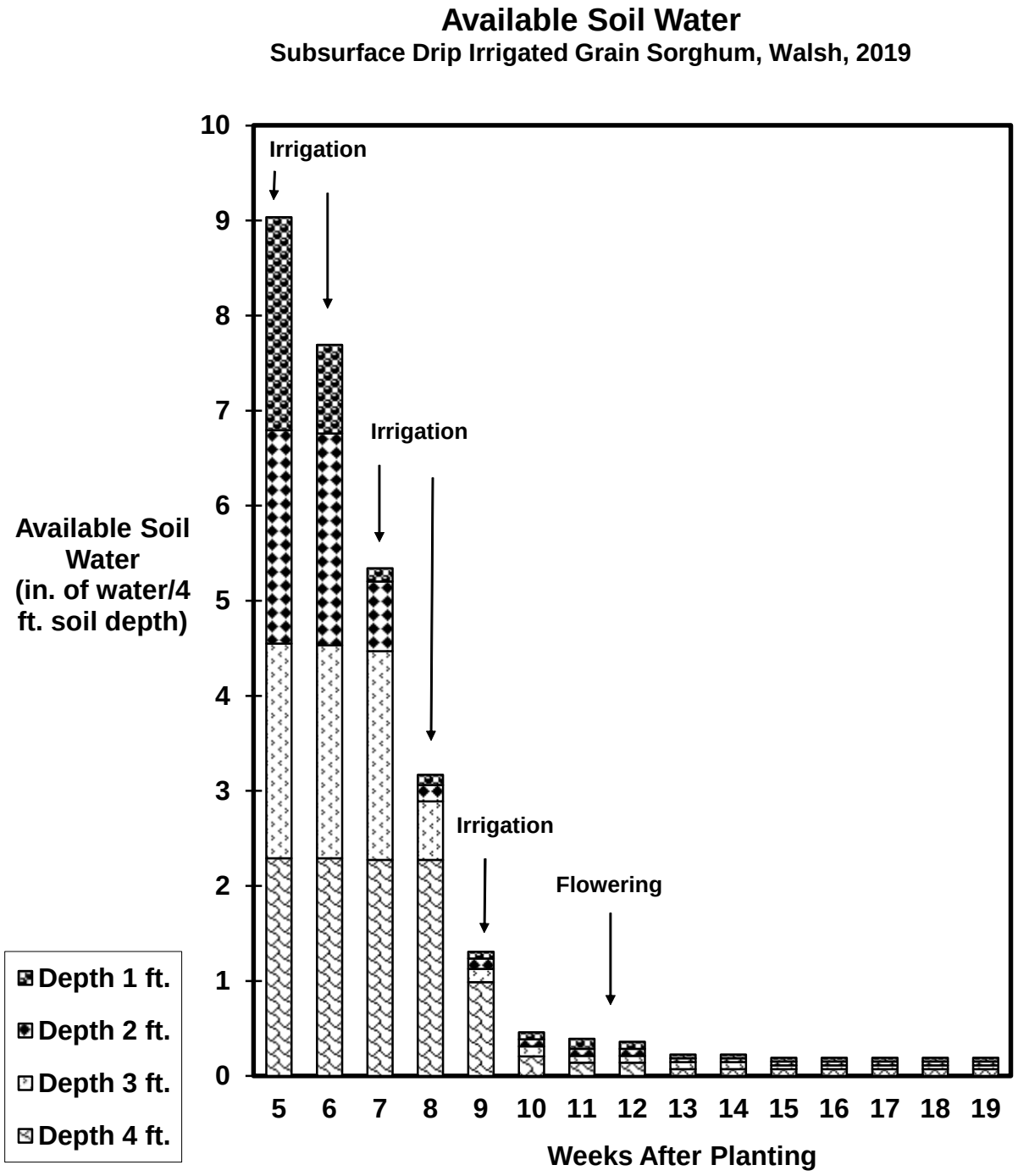

Fig. 2. Available soil water in drip irrigated grain sorghum at Walsh. Gypsum block measurements taken to 4 ft. with 1 ft. increments. Rainfall at Walsh from planting to first freeze was 9.26 in. Total applied drip irrigation was 6.7 in/a. Any increase in available soil water between weeks not attributed to irrigation is from rain.

2019 Dryland Hybrid Forage Sorghum Performance Trial at Walsh

Brand	Hybrid	Forage Yield[a]	Yield	Stem Sugar	Harvest Density	Plant Height	Lodging	Days to Boot	Relative Maturity[b]	Forage Type[c]	Traits[d]
		tons/ac	% of test avg.	%	plants/ac (1000x)	in	%	days after planting			
Sorghum Partners	SP1880	9.1	155	14.1	50.7	83	20	97	ML	FS	-
Dyna-Gro Seed	Fullgraze II	8.6	148	21.6	49.6	81	60	97	ML	SS	-
Alta Seeds	AF8301	8.2	139	17.7	52.7	45	10	90	M	FS	-
Dyna-Gro Seed	F72FS05	8.1	137	20.2	44.5	44	0	100	ML	FS	SCA
Alta Seeds	ADV XF033	7.6	129	21.6	44.1	35	0	109	L	FS	SCA
Dyna-Gro Seed	Super Sile 30	7.3	125	21.4	53.4	59	15	95	ML	FS	-
Dyna-Gro Seed	F74FS72 BMR	7.3	124	21.5	44.9	34	0	107	L	FS	BMR, BD
Dyna-Gro Seed	TopTon	7.2	122	16.4	55.8	61	90	Veg	PS	FS	-
Gayland Ward Seed	18181	6.9	118	16.4	50.7	74	90	Veg	PS	FS	-
Dyna-Gro Seed	Danny Boy II BMR	6.9	117	19.2	47.2	65	40	Veg	PS	SS	BMR
Gayland Ward Seed	19153	6.9	117	22.3	60.8	82	35	89	M	FS	-
Sorghum Partners	NK300	6.8	115	18.9	54.2	44	0	86	M	FS	-
Alta Seeds	AF7401	6.6	112	19.8	50.7	39	0	117	L	FS	BMR, BD
Dyna-Gro Seed	Fullgraze II BMR	6.4	109	16.6	50.0	58	12	Veg	PS	SS	BMR
Mojo Seed	Opal	6.2	105	19.3	38.7	50	4	94	ML	FS	BD
Dyna-Gro Seed	Super Sile 20	6.2	105	19.9	66.6	59	12	94	ML	FS	-
Gayland Ward Seed	19154	6.1	103	20.8	52.7	71	90	101	ML	FS	-
Alta Seeds	ADV F7232	6.0	103	22.5	46.5	41	0	104	ML	FS	BMR, BD
Gayland Ward Seed	19102	5.8	98	16.8	50.0	66	45	Veg	PS	FS	-
Sorghum Partners	SP1615	5.7	97	16.9	52.7	58	50	Veg	PS	FS	-
Sorghum Partners	SS506	5.6	96	15.0	50.3	70	98	99	ML	FS	-
Gayland Ward Seed	18180	5.4	92	18.0	44.5	81	25	72	ME	SS	-
Sorghum Partners	SP3904 BD BMR	5.4	92	19.6	43.8	43	0	107	L	FS	BMR, BD
Dyna-Gro Seed	FX19178 BMR	5.4	91	23.5	43.8	40	0	88	M	FS	BMR, BD
Dyna-Gro Seed	FX19125 BMR	5.0	86	17.3	38.3	70	60	63	E	FS	BMR
Alta Seeds	AF7102	4.9	83	19.7	44.1	52	1	69	E	FS	BMR
Dyna-Gro Seed	FX19819 BMR	4.8	82	19.1	38.0	38	0	97	ML	FS	BMR
Alta Seeds	ADV XF025	4.6	78	15.2	45.3	68	30	62	E	FS	BMR
Gayland Ward Seed	18118	4.5	78	20.1	53.8	68	92	67	E	SS	BMR
Sorghum Partners	SS405	4.4	76	18.8	43.4	72	97	99	ML	FS	-
Dyna-Gro Seed	GX13692	3.9	67	DS[e]	44.5	120	7	71	ME	FS	-
Dyna-Gro Seed	Dual Forage SCA II	3.8	66	DS[e]	48.8	44	35	71	ME	FS	SCA
Sorghum Partners	SP2774	3.8	64	13.0	43.4	67	70	72	ME	FS	BMR
Gayland Ward Seed	18119	3.7	63	20.0	58.9	59	65	67	E	SS	BMR
Gayland Ward Seed	19155	3.6	61	18.3	64.7	61	8	75	ME	FS	BMR
Dyna-Gro Seed	FX19526 BMR	2.7	45	19.7	43.4	42	50	76	ME	FS	BMR
Average		**5.9**		**18.9**	**49.0**	**60**	**34**	**88**			
[f]LSD (P<0.20)		3.6									

[a]Yields are adjusted to 65% moisture content based on oven-dried samples.

[b]Relative Maturity: E=early; ME=medium-early; M=medium; ML=medium-late; L=late; PS=photoperiod sensitive.

[c]Forage Type: FS=forage sorghum; S=sudangrass; SS=sorghum sudangrass.

[d]Traits: BD=brachytic dwarf; BMR=brown mid-rib; BMR-6=one of the three main brown mid-rib genes; SCA=Sugar Cane Aphid.

[e]Stem Sugar: DS=dry stalk, unable to measure stem sugar.

[f]If the difference between two varieties yields equals or exceeds the LSD value, then they are significantly different with less than 20% probability that the difference is due to random error.

Site Information

Collaborator:	Plainsman Research Center (Kevin Larson & Brett Pettinger)
Planting Date:	June 6, 2019
Harvest Date:	October 22, 2019
Previous Crop:	Wheat
Herbicide:	Preemergence: Flumioxazin at 2.5 oz/ac; Atrazine at 1.0 lb/ac; and Metolachlor at 1.33 pts/ac.
Fertilizer:	Anhydrous N at 50 lb/ac and 10-34-0 at 5 gal/ac was strip till applied.
Soil Type:	Richfield silt loam
Comments:	Planted into strip tilled wheat stubble. Rapid emergence and good stands. From planting (June 6) to July 2, the trial received 5.96 inches of rain. The rest of the growing season was dry, totaling 2.61 inches of rain from July 3 to October 11 (first freeze). Weed control was good, except for a moderate infestation of sandbur, which required cultivation. Some lodging noted at harvest.

2019 Dryland Forage Sorghum Hybrid Performance Trial Feed Quality at Walsh

Brand	Hybrid[a]	Forage Type[b]	RFQ	CP	ADF	aNDFom	Lignin	Starch	NDFD 30hr	NDFD 240hr	TDN	Milk/Ton
				percent								
Dyna-Gro Seed	Fullgraze II BMR	SS	161	8.6	27.9	46.3	1.6	2.5	63.3	80.6	65.7	3253
Dyna-Gro Seed	F74FS72 BMR	FS	153	8.2	29.1	46.3	1.9	2.2	60.2	78.1	64.6	3206
Dyna-Gro Seed	Danny Boy II BMR	SS	151	8.8	30.8	47.1	2.1	3.0	62.1	81.5	63.6	3090
Alta Seeds	AF7401	FS	146	7.9	30.4	46.9	2.6	2.2	58.4	74.9	63.1	3113
Dyna-Gro Seed	FX19526 BMR	FS	146	14.4	30.8	54.6	2.8	0.1	68.2	81.8	64.4	3021
Sorghum Partners	SP3904 BD BMR	FS	145	8.0	30.1	46.4	2.6	0.8	55.8	70.7	64.1	3238
Dyna-Gro Seed	TopTon	FS	141	8.0	29.8	46.8	2.6	2.9	56.4	77.4	62.5	3091
Dyna-Gro Seed	FX19819 BMR	FS	138	10.4	31.4	52.1	2.8	2.0	64.1	77.6	61.6	2876
Gayland Ward Seed	19155	FS	138	12.4	32.9	56.3	2.7	0.1	67.3	81.8	63.5	2957
Gayland Ward Seed	18118	SS	136	13.4	33.9	57.3	2.9	0.1	67.2	81.2	63.6	2969
Alta Seeds	AF7102	FS	132	12.2	33.7	55.9	2.9	0.1	65.5	77.9	61.8	2855
Alta Seeds	ADV F7232	FS	131	9.6	32.6	54.1	3.0	0.2	61.3	76.7	61.2	2899
Gayland Ward Seed	18181	FS	131	8.5	30.7	50.8	2.9	3.6	58.6	77.0	61.6	2901
Dyna-Gro Seed	Super Sile 30	FS	129	10.5	32.5	52.8	3.1	0.1	60.0	76.1	61.5	2953
Alta Seeds	ADV XF025	FS	129	13.1	34.3	58.9	3.4	0.1	66.2	79.2	61.7	2819
Gayland Ward Seed	18119	SS	129	12.7	33.3	57.4	3.0	0.1	64.6	78.0	61.9	2885
Sorghum Partners	SP1615	FS	128	9.0	31.9	54.2	2.8	0.9	60.7	77.6	61.5	2937
Dyna-Gro Seed	F72FS05	FS	127	9.9	31.5	53.7	3.1	0.1	58.5	75.9	61.0	2943
Alta Seeds	ADV XF033	FS	127	8.7	31.9	51.3	3.6	1.3	56.3	70.8	61.5	3023
Dyna-Gro Seed	FX19125 BMR	FS	122	13.2	35.9	53.8	3.5	0.1	60.9	75.8	59.8	2784
Gayland Ward Seed	19102	FS	121	8.2	31.7	52.3	3.2	2.5	56.2	75.5	59.0	2805
Gayland Ward Seed	19153	FS	121	10.9	32.6	55.1	3.2	0.1	57.2	74.8	60.2	2893
Dyna-Gro Seed	Fullgraze II	SS	120	9.4	34.0	56.2	3.5	0.1	58.8	77.8	60.7	2912
Dyna-Gro Seed	GX13692	FS	119	13.5	34.8	56.2	3.7	0.1	60.4	75.5	59.8	2793
Alta Seeds	AF8301	FS	116	10.1	33.8	54.8	3.9	0.1	57.1	72.6	59.4	2832
Sorghum Partners	SP2774	FS	116	13.1	36.3	57.6	3.8	0.1	60.2	73.5	59.2	2750
Dyna-Gro Seed	Super Sile 20	FS	115	10.5	34.3	51.4	4.0	0.1	52.1	69.7	58.6	2846
Sorghum Partners	SS506	FS	115	10.2	35.1	59.3	3.7	0.1	60.8	77.5	58.7	2698
Gayland Ward Seed	19154	FS	115	9.9	33.0	55.4	3.6	0.7	55.6	72.9	59.2	2846
Dyna-Gro Seed	Dual Forage SCA II	FS	112	12.8	36.6	60.2	3.8	0.1	60.5	77.0	58.8	2707
Gayland Ward Seed	18180	SS	111	11.5	34.7	58.4	3.8	0.1	57.7	74.6	59.0	2790
Sorghum Partners	SS405	FS	110	9.1	34.7	58.2	4.0	0.1	56.9	72.7	58.4	2757
Mojo Seed	Opal	FS	103	12.2	34.6	50.4	4.1	0.1	48.6	67.6	55.7	2648
Sorghum Partners	SP1880	FS	103	8.2	36.1	58.7	3.9	0.1	54.2	71.8	57.6	2759
Sorghum Partners	NK300	FS	102	11.4	36.6	56.8	4.6	0.1	53.9	68.8	57.1	2705
Dyna-Gro Seed	FX19178 BMR	FS	89	11.7	36.7	56.2	4.6	0.1	49.5	69.1	53.1	2449
Average			**126**	**10.6**	**33.1**	**53.9**	**3.3**	**0.8**	**59.3**	**75.6**	**60.7**	**2889**

[a]Hybrids ranked according to relative forage quality score (RFQ)

[b]Forage Type: FS=forage sorghum; SS=sorghum sudangrass

All analyses results are dry basis values. RFQ=relative forage quality; CP=crude protein; ADF=acid detergent fiber; aNDFom=ash free neutral detergent fiber; NDFD=neutral detergent fiber digestibility; Milk/ton=Calculated using MILK2006; TDN=total digestable nutrients.

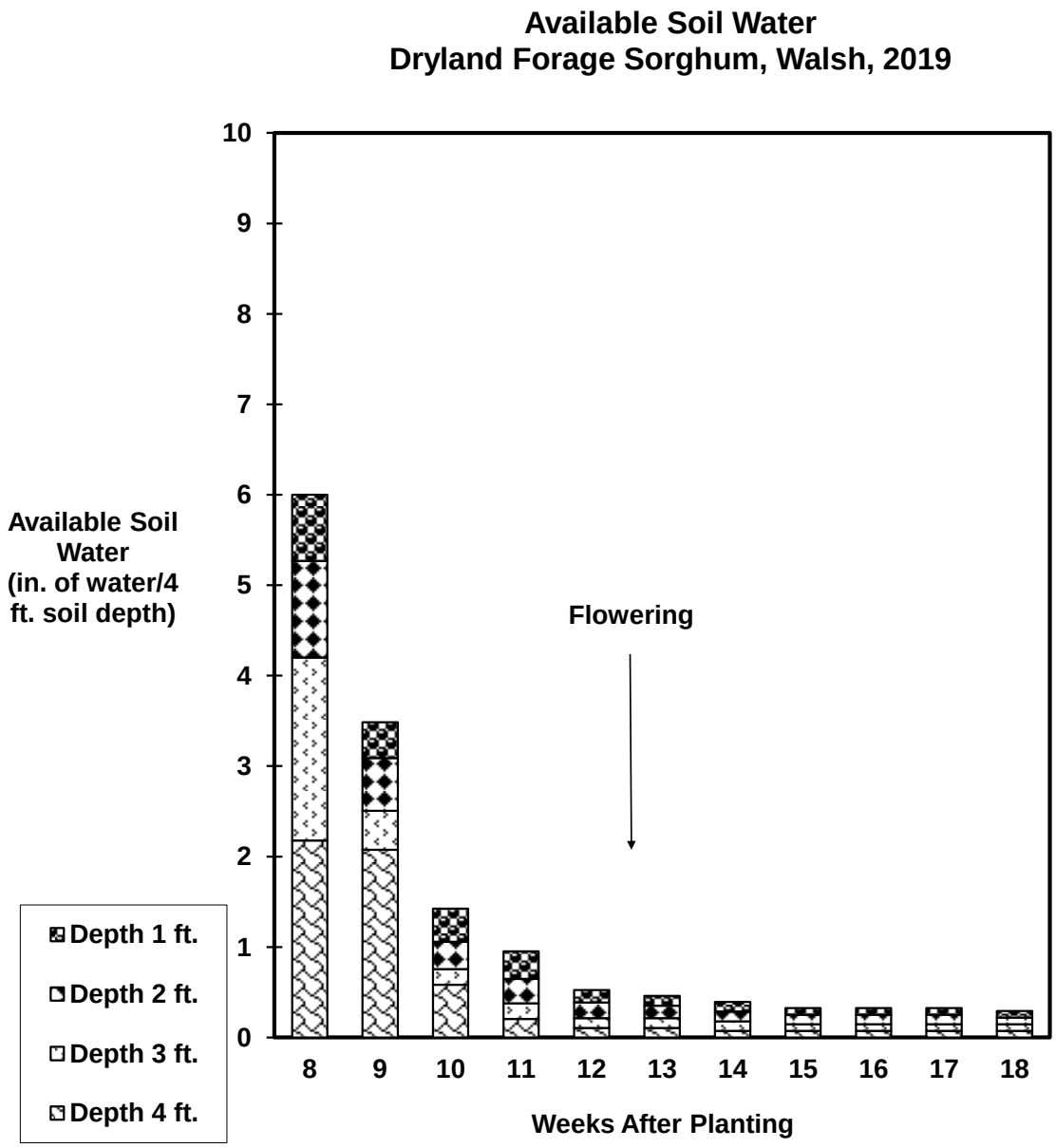

Fig. 3. Available soil water in dryland forage sorghum at Walsh. Gypsum block measurements taken to 4 ft. with 1 ft. increments. Total rainfall at Walsh from planting to harvest was 8.54 in. Any increase in available soil water between weeks is from rain.

2019 Irrigated Forage Sorghum Hybrid Performance Trial at Rocky Ford

Brand	Hybrid	Forage Yield[a]	Yield	Moisture	Stem Sugar	Lodging	Plant Height	Harvest Maturity	Relative Maturity[b]	Forage Type[c]	Traits[d]
		tons/ac	% of test avg.	% at harvest	%	scale 0-9[e]	in				
Gayland Ward Seed	19176	**43.3**	147	59	11	0	121	Hard Dough	-	-	-
Dyna-Gro Seed	Fullgraze II	**42.5**	144	62	1	0	156	Soft Dough	ML	SS	-
Dyna-Gro Seed	Super Sile 20	**42.2**	143	66	15	6	120	Hard Dough	ML	F	-
Dyna-Gro Seed	Super Sile 30	**42.1**	143	65	10	6	131	Hard Dough	ML	F	-
Gayland Ward Seed	19038	**40.6**	137	60	13	0	88	Hard Dough	-	-	-
Dyna-Gro Seed	TopTon	37.9	128	63	14	8	118	Hard Dough	ML	F	-
Dyna-Gro Seed	Fullgraze II BMR	37.8	128	64	13	5	129	Soft Dough	ML	SS	BMR
Dyna-Gro Seed	F72FS05	37.6	127	60	9	0	84	Hard Dough	ME	F	SCA
Gayland Ward Seed	19042	37.5	127	66	9	0	102	Soft Dough	-	-	-
Gayland Ward Seed	18180	36.9	125	67	13	0	127	Soft Dough	-	-	-
Gayland Ward Seed	19153	36.8	125	68	17	0	126	Soft Dough	-	-	-
Gayland Ward Seed	19102	36.8	125	79	5	0	139	Flowering	-	-	-
Gayland Ward Seed	19178	36.4	123	62	9	7	108	Hard Dough	-	-	-
Gayland Ward Seed	19154	36.3	123	66	9	0	124	Soft Dough	-	-	-
Gayland Ward Seed	18181	35.4	120	74	11	0	121	Flowering	-	-	-
Gayland Ward Seed	19174	34.4	117	68	10	7	102	Soft Dough	-	-	-
Dyna-Gro Seed	Danny Boy II BMR	34.4	116	78	8	0	127	Flowering	PS	SS	BMR
Alta	AF8301	34.0	115	59	4	0	85	Mature	M	F	-
Gayland Ward Seed	18182	33.5	113	57	10	6	105	Mature	-	-	-
Gayland Ward Seed	19177	32.9	111	56	3	7	91	Mature	-	-	-
Gayland Ward Seed	18552	32.4	110	57	7	7	114	Mature	-	-	-
Gayland Ward Seed	18351	32.2	109	60	6	0	79	Mature	-	-	-
Alta	ADV XF025	31.9	108	54	8	6	99	Mature	ME	F	BMR
Gayland Ward Seed	18118	31.8	108	61	15	7	107	Mature	-	-	-
Alta	ADV XF033	31.7	107	60	3	0	83	Hard Dough	M	F	SCA
Dyna-Gro Seed	Dual Forage SCA II	30.7	104	57	3	5	75	Mature	M	F	SCA
Gayland Ward Seed	18178	30.4	103	64	9	7	103	Mature	-	-	-
Dyna-Gro Seed	GX13692	30.4	103	61	1	0	84	Mature	M	F	-
Gayland Ward Seed	18116	29.5	100	59	4	7	100	Mature	-	-	-
Alta	AF7401	28.9	98	64	4	0	77	Mature	ML	F	BMR, BD
Gayland Ward Seed	18487	28.9	98	61	10	0	102	Mature	-	-	-
Gayland Ward Seed	18179	28.9	98	62	10	0	101	Mature	-	-	-
Dyna-Gro Seed	FX19125 BMR	28.8	97	57	8	0	98	Hard Dough	E	F	BMR
Gayland Ward Seed	19179	27.8	94	70	12	0	81	Soft Dough	-	-	-
Dyna-Gro Seed	F74FS72 BMR	26.9	91	64	6	0	71	Mature	M	F	BMR, BD
Gayland Ward Seed	19175	26.8	91	57	2	6	93	Hard Dough	-	-	-
Gayland Ward Seed	19181	26.7	91	65	12	0	83	Hard Dough	-	-	-
Gayland Ward Seed	18096	26.5	90	63	2	0	71	Hard Dough	-	-	-
Dyna-Gro Seed	FX19526 BMR	26.2	89	60	10	5	74	Mature	E	F	BMR
Alta	ADV F7232	25.2	85	68	9	0	70	Mature	M	F	BMR, BD
Gayland Ward Seed	18119	24.2	82	67	15	0	103	Mature	-	-	-
Mojo Seed	Opal	24.1	82	66	4	0	93	Hard Dough	M	F	BD
Alta	AF7102	22.2	75	68	6	0	82	Mature	ME	F	BMR
Blue River Organic Seed	Blackhawk 12	21.5	73	63	10	0	105	Soft Dough	M	SS	BMR-12
Dyna-Gro Seed	FX19819 BMR	17.4	59	67	7	0	59	Mature	E	F	BMR
Dyna-Gro Seed	FX19178 BMR	16.4	56	68	3	0	63	Mature	M	F	BMR, BD
Blue River Organic Seed	Nighthawk 6	15.4	52	70	12	0	100	Soft Dough	L	SS	BMR-6, BD
Average		**31.3**		**63.7**	**8**	**2**	**99**				
[f]LSD (P<0.20)		4.7									

[a]Yields are adjusted to 65% moisture content based on oven-dried samples

[b]Relative maturities are provided by the companies. E=early; ME=medium-early; M=medium; ML=medium-late; L=late; PS=photoperiod sensitive. Dashes means maturity information isn't available.

[c]Forage Type: F=forage sorghum; SS=sorghum sudangrass. Dashes mean information isn't available.

[d]Traits are provided by the companies. Dashes mean conventional (no traits) or information isn't available. BD=brachytic dwarf; BMR=brown mid-rib; BMR-6=one of the three main brown mid-rib genes; BMR-12=one of the three main brown mid-rib genes; SCA=Sugar Cane Aphid.

[e]Scale where 0=no lodging and 9=severe lodging

[f]If the difference between two hybrid yields equals or exceeds the LSD value, there is an 80% chance the difference is significant

Site Information

Collaborator:	Arkansas Valley Research Center (Mike Bartolo and Kevin Tanabe)
Planting Date:	May 28, 2019
Harvest Date:	September 23, 2019
Previous Crop:	Corn
Herbicide:	May 16, 2019: Dual 1.5 pints/acre and June 17, 2019: Huskie at 16 oz/ac
Fertilizer:	March 18, 2019: N at 16.5 and P at 78 lb/ac as 11-52-0
Irrigation:	Crop was furrow irrigated on May 29, June 7, June 24, July 16, Aug. 2, Aug. 22, and Sep. 3
Soil Type:	Rocky Ford silty clay loam
Comments:	Two hail storms on trial. Crop was cultivated on June 28.

2019 Irrigated Forage Sorghum Hybrid Performance Trial Feed Quality at Rocky Ford

Brand	Hybrid[a]	Forage Type[b]	RFQ	CP	ADF	aNDFom	Lignin	Starch	NDFD 30hr	NDFD 240hr	TDN	Milk/Ton
				percent								lbs
Dyna-Gro Seed	FX19526 BMR	F	167	9.6	24.4	29.8	3.4	37.4	22.3	44.3	63.9	3311
Gayland Ward Seed	19177	-	159	10.2	25.6	31.8	3.4	32.0	27.5	50.3	62.9	3255
Gayland Ward Seed	19175	-	157	10.2	26.4	30.7	4.1	36.5	22.6	43.1	62.4	3205
Gayland Ward Seed	18487	-	154	9.7	25.0	32.3	3.4	31.1	25.9	50.0	63.0	3280
Alta	ADV XF025	F	152	9.9	23.8	32.5	3.6	34.8	25.4	46.3	62.9	3273
Dyna-Gro Seed	GX13692	F	149	9.2	25.7	30.9	4.3	39.1	18.5	39.3	61.7	3150
Dyna-Gro Seed	FX19125 BMR	F	143	9.7	26.7	34.6	4.3	32.8	29.7	47.9	61.5	3180
Gayland Ward Seed	19038	-	142	9.6	24.9	34.1	3.8	33.4	26.5	47.1	61.8	3210
Gayland Ward Seed	19178	-	139	10.3	27.1	37.0	3.5	28.4	35.7	55.4	60.5	3087
Dyna-Gro Seed	Dual Forage SCA II	F	136	8.7	26.4	33.3	4.3	37.0	20.5	40.4	60.7	3124
Gayland Ward Seed	18116	-	136	8.9	27.5	35.4	3.7	29.3	28.8	50.5	59.7	3040
Alta	AF7102	F	131	9.1	29.3	37.3	3.5	25.9	33.4	56.7	59.0	2975
Alta	AF7401	F	131	9.3	26.8	37.3	3.7	30.8	32.3	51.8	59.9	3062
Dyna-Gro Seed	F74FS72 BMR	F	131	8.9	26.6	36.6	4.0	29.9	31.2	51.1	60.1	3076
Gayland Ward Seed	19181	-	130	10.6	28.4	40.6	3.4	24.9	40.0	60.9	59.8	3032
Mojo Seed	Opal	F	128	10.6	26.8	37.3	4.0	31.2	28.6	50.0	60.2	3116
Gayland Ward Seed	18096	-	125	10.0	28.6	37.1	4.1	30.3	29.0	51.5	58.6	2977
Gayland Ward Seed	18351	-	125	9.8	28.3	35.5	4.1	32.1	24.1	46.6	58.5	2965
Alta	ADV F7232	F	124	8.6	29.1	40.7	3.6	25.9	36.9	58.6	59.0	2996
Gayland Ward Seed	19174	-	124	10.0	30.6	43.0	4.0	23.4	42.8	61.5	58.4	2904
Dyna-Gro Seed	Super Sile 30	F	119	9.6	27.7	39.5	4.6	31.2	32.0	51.0	59.1	3031
Gayland Ward Seed	19042	-	119	9.3	28.5	39.8	4.1	28.3	31.4	53.1	58.7	3017
Gayland Ward Seed	18118	-	119	9.5	31.0	41.9	3.7	20.3	39.0	61.8	57.1	2823
Dyna-Gro Seed	Fullgraze II BMR	SS	118	11.4	27.9	47.5	4.6	16.7	47.8	63.8	60.4	3049
Dyna-Gro Seed	TopTon	F	116	8.5	27.1	37.0	4.7	34.7	23.7	43.8	57.7	2922
Blue River Organic Seed	Nighthawk 6	SS	114	11.3	32.4	47.0	4.3	14.0	46.8	65.1	57.5	2804
Alta	AF8301	F	113	8.8	27.1	37.1	4.4	31.2	22.8	44.1	57.5	2910
Dyna-Gro Seed	Super Sile 20	F	112	9.8	28.3	39.5	4.8	30.1	28.9	48.7	57.7	2936
Alta	ADV XF033	F	112	8.5	27.3	38.2	4.5	31.5	24.3	45.1	57.5	2928
Blue River Organic Seed	Blackhawk 12	SS	111	9.3	28.5	39.5	5.0	28.2	29.1	49.5	57.9	2950
Gayland Ward Seed	18119	-	111	10.1	31.8	44.7	3.7	14.9	41.0	63.7	55.7	2711
Gayland Ward Seed	19176	-	109	9.9	29.9	44.1	4.7	24.5	35.6	55.9	57.6	2937
Gayland Ward Seed	18178	-	109	10.2	29.3	39.1	4.4	24.9	28.0	49.9	56.4	2820
Dyna-Gro Seed	FX19819 BMR	F	109	9.4	32.0	44.2	4.5	23.4	38.1	57.9	56.4	2806
Gayland Ward Seed	19179	-	107	9.9	32.1	46.4	4.2	18.5	40.1	61.1	56.7	2835
Dyna-Gro Seed	F72FS05	F	107	8.2	28.5	40.4	4.7	30.0	28.6	48.7	56.8	2879
Dyna-Gro Seed	FX19178 BMR	F	105	10.0	32.3	44.3	4.6	22.1	38.1	56.5	55.6	2737
Gayland Ward Seed	18182	-	105	9.4	30.4	42.8	4.6	22.2	32.7	55.7	56.4	2849
Gayland Ward Seed	18552	-	103	9.2	30.6	40.6	4.8	25.2	26.3	50.2	55.8	2810
Gayland Ward Seed	19154	-	97	9.4	32.4	44.6	5.2	21.9	33.6	54.7	54.5	2697
Gayland Ward Seed	18179	-	95	9.5	31.8	43.0	4.7	21.5	29.8	53.5	54.0	2670
Dyna-Gro Seed	Fullgraze II	SS	87	10.2	35.8	55.1	5.7	11.6	44.2	63.2	53.3	2565
Gayland Ward Seed	18180	-	86	9.5	33.9	49.1	5.1	17.5	35.6	58.4	52.5	2565
Dyna-Gro Seed	Danny Boy II BMR	SS	86	11.5	41.8	58.7	4.4	0.1	51.6	72.4	50.2	2164
Gayland Ward Seed	18181	-	86	9.1	37.6	57.6	4.7	2.1	46.3	69.3	52.3	2459
Gayland Ward Seed	19153	-	82	9.9	34.5	49.8	5.4	16.7	34.8	58.2	51.7	2516
Gayland Ward Seed	19102	-	66	9.9	43.4	64.2	5.7	0.1	45.0	67.6	46.6	2051
			119	**9.7**	**29.6**	**40.9**	**4.3**	**25.3**	**32.7**	**53.7**	**57.8**	**2908**

[a]Hybrids ranked according to relative forage quality score (RFQ)

[b]Forage Type: F=forage sorghum; SS=sorghum sudangrass

All analyses results are dry basis values. RFQ=relative forage quality; CP=crude protein; ADF=acid detergent fiber; aNDFom=ash free neutral detergent fiber; NDFD=neutral detergent fiber digestibility; Milk/ton=Calculated using MILK2006; TDN= Total Digestable Nutrients.