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2015 Sorghum Hybrid Performance  
Trials in Eastern Colorado

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## 2015 SORGHUM HYBRID PERFORMANCE TRIALS IN EASTERN COLORADO

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SORGHUM HYBRID PERFORMANCE TRIALS IN EASTERN COLORADO, 2015  
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The 2015 Colorado grain sorghum crop was estimated at 14.0 million bushels, two-thirds larger than the 2014 sorghum crop of 8.40 million bushels. For Colorado, the 2015 grain sorghum crop of 14.0 million bushels was the largest in the last 10 years. The increase in sorghum production this year was due to the highest harvested acres, 350,000 acres, for the last 10 years. The grain yield this year was estimated at 40.0 bu/acre, which was 10 bu/acre more than last year and 7.5 bu/acre more than the 10 year average. As the production and yield levels indicate, conditions in Eastern Colorado for 2015 were generally wetter than normal. Sorghum silage statistics are not published during the current year; however, Colorado sorghum silage statistics are available for last year. In 2014, 110,000 tons of sorghum silage was produced. The average yield was 11 tons/acre from 10,000 harvested acres. (USDA and National Agricultural Statistics Service, Colorado Field Office, 2015).

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 three sites in eastern Colorado: Akron, Brandon, and Walsh. Forage sorghum trials were conducted at Rocky Ford (irrigated) and at Walsh (dryland).

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](mailto:Jerry.Johnson@colostate.edu); or Kevin Larson, phone (719) 324-5643, email [Kevin.Larson@colostate.edu](mailto:Kevin.Larson@colostate.edu) for further details. Names and addresses of firms submitting entries in 2015 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, 2015), 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 2015 Colorado Sorghum Performance Trials.

Brand	Entered by
ALTA SEEDS	Advanta US, 2001 E. 1 <sup>st</sup> St., P.O. Box 2420, Hereford, TX 79045
DEKALB	Monsanto Company, 800 N. Lindbergh Blvd., St. Louis, MO 63167
GAYLAND WARD SEED	Gayland Ward Seed Co. Inc., 4395 US Hwy 60, Hereford, TX 79045
HEARTLAND GENETICS	Heartland Genetics, LLC, Beloit, KS 67420
MYCOGEN SEEDS	Mycogen Seeds, 9330 Zionsville Rd., Indianapolis, IN 46268
PAWNEE BUTTES SEED	Pawnee Buttes Seed, Inc., P.O. Box 100, 605 25 <sup>th</sup> St., Greeley, CO 80632
RICHARDSON SEEDS	Richardson Seeds, Ltd., P.O. Box 60, 3095 CR 26, Vega, TX 79092
SHARP BROTHERS	Sharp Brothers Seed Co., 101 E. 4 <sup>th</sup> St. Rd., Greeley, CO 80631
SORGHUM PARTNERS	Chromatin, Inc., 403 South Monroe, New Deal, TX 79350
WALTER MOSS SEED CO.	Walter Moss Seed Co., P.O. Box 21114, Waco, TX 76702

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:

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

### Experimental Methods and Evaluations

Trials 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. Sorghum forage was cut and chopped with a single row John Deere 8 silage cutter.

Days to Emergence. Seedling emergence was determined as the number of days after planting until approximately half of the seedlings become 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 provides 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 becomes 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 were leaning more than a 45 degree angle were considered lodged. Since the combine was equipped with a row crop head, most of the leaning tillers were harvested.

Harvest Density. Plant population in plants per acre was counted prior to harvest.

Test Weight. Test weight was determined using a hand-held bushel weight tester. 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 provides a comparison between yields within a trial and allows easy comparisons among years, irrespective of annual growing conditions.

Forage Yield. Forage yield in tons per acre was adjusted to 70% moisture content. A representative sample of fresh silage was oven-dried at 167°F (75°C) until there was no more weight loss, and then yields were adjusted to 70% 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 placing gypsum blocks at 6, 18, 30, and 42 inches below the soil surface. Electrical resistance readings were made weekly or biweekly. Resistance readings vary with the amount of soil water present. Using resistance readings, available soil water was determined by extrapolating from soil water depletion curves for each particular 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 with CoStat Statistical Software a product of Cohort Software, Berkeley, California.

### Acknowledgements

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

## References

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## Dryland Grain Sorghum Performance Trial at Akron, 2015

**COOPERATOR:** USDA-ARS Central Great Plains Research Station.

**PURPOSE:** To identify high yielding hybrids under dryland conditions with 2850 sorghum heat units in a loam soil.

**PLOT:** Four rows with 30 in. row spacing, 35 ft. long. **SEEDING DENSITY:** 43,600 seed/ac. **PLANTED:** June 4. **HARVESTED:** November 16.

**PEST CONTROL:** Preemergence Herbicides: Lumax at 1.75 qt/ac and Cornerstone Plus at 48 oz/ac. **Cultivation:** None. **Insecticides:** None.

**SOIL:** Platner loam.  
**FERTILIZER:** Nitrogen 50 lb/ac.

**FIELD HISTORY:** Last Crop: Wheat.

**FIELD PREPARATION:** No-till.

Summary: Growing Season Precipitation and Temperature Akron, Washington County. <sup>a</sup>					
Month	Rainfall	GDD <sup>b</sup>	>90 F	>100 F	DAP <sup>c</sup>
	In		-----no. of days-----		
June	2.21	553	5	0	27
July	2.21	729	16	0	58
August	2.55	714	16	0	89
September	0.12	575	11	0	119
October	0.95	307	1	0	150
Total	8.04	2878	49	0	150

<sup>a</sup>Growing season from June 4 (planting) to November 16 (harvest).  
<sup>b</sup>GDD: Growing Degree Days for sorghum.  
<sup>c</sup>DAP: Days After Planting.

**COMMENTS:** Planted into good soil moisture and received rain a few days after planting. Trial had consistent stands and very good emergence. Weed control was good throughout the season. Temperatures were mild through most of the summer. The trial suffered extensive hail damage from a storm on August 1<sup>st</sup>. Lodging occurred after a wind/snow storm in early November.

## 2015 Dryland Grain Sorghum Hybrid Performance Trial at Akron

Brand	Hybrid	Grain	Yield	Test	Lodging <sup>b</sup>	Harvest	Plant	50%	GDD <sup>c</sup>	Maturity Group <sup>d</sup>	Grain Color
		Yield <sup>a</sup>	% of test average	Weight		Plant Population	Plant Height	Bloom			
		bu/ac		lb/bu	percent	plants/ac	in	after planting			
Dekalb	DKS29-28	47.5	143	58.5	29	27,443	36	71	1619	E	Bronze
Mycogen Seeds	1G557	41.1	124	58.5	24	32,234	36	71	1622	E	Bronze
Alta Seeds	AG2115	38.3	115	57.8	11	26,644	41	85	1923	M	Red
Gayland Ward Seed	GW-1160	36.8	111	58.3	2	31,291	41	82	1852	M	Bronze
Sharp Brothers	Sprint II	36.5	110	58.7	52	26,644	38	74	1685	E	Red
Dekalb	DK28E	35.5	107	58.1	18	31,000	33	67	1516	E	Bronze
Sorghum Partners	K35Y5	35.1	106	58.8	47	25,628	35	72	1663	ME	Cream
Mycogen Seeds	1G588	34.3	103	58.5	34	28,750	41	75	1708	ME	Bronze
Dekalb	DKS28-05	34.0	102	57.9	29	31,363	38	66	1498	E	Bronze
Alta Seeds	AG1201	33.4	100	58.2	58	24,103	34	73	1688	ME	Bronze
Gayland Ward Seed	GW-1180	31.7	95	57.5	44	25,410	39	74	1702	ME	Bronze
Alta Seeds	AG2105	28.8	87	58.0	36	24,176	42	82	1851	M	Red
Gayland Ward Seed	GW-9417	26.1	79	56.4	11	30,782	42	87	1979	ML	Red
Richardson Seeds	Swift	24.9	75	58.2	49	27,733	35	64	1456	E	Red
Alta Seeds	AG1101	24.5	74	56.8	23	28,387	34	67	1515	E	Red
Alta Seeds	AG1203	23.4	70	56.6	8	23,377	42	86	1952	ME	Bronze
<b>Average</b>		<b>33.2</b>		<b>57.9</b>	<b>30</b>	<b>27,800</b>	<b>38</b>	<b>75</b>	<b>1702</b>		

<sup>e</sup>LSD (P<0.30)

5.8

<sup>a</sup>Yields adjusted to 14% moisture and hybrids ranked by yield within maturity group

<sup>b</sup>Lodging was a result of a severe mid-season hail storm and a late-season snow and wind storm

<sup>c</sup>GDD: Growing degree-days to 50% bloom date

<sup>d</sup>Maturity Group: E=early; ME=medium-early; M=medium; ML=medium-late

<sup>e</sup>If the difference between two varieties yields equals or exceeds the LSD value, there is a 70% chance the difference is significant.

## Dryland Grain Sorghum Hybrid Performance Trial at Brandon, 2015

COOPERATOR: Burl Scherler, Sand Creek, Inc., Brandon, Colorado.

PURPOSE: To identify high yielding hybrids under dryland conditions with 2930 sorghum heat units in sandy loam soil.

PLOT: Four rows with 30 in. row spacing, 50 ft. long. SEEDING DENSITY: 43,600 seed/a. PLANTED: June 9. HARVESTED: November 3.

PEST CONTROL: Preemergence Herbicides: Valor 3 oz/a, Atrazine 0.9 lb/a, S-Metolachlor 21 oz/a; Post Emergence Herbicides: Ally 0.05 oz/a, 2,4-D amine 0.5 lb/a. Cultivation: None. Insecticides: None.

FIELD HISTORY: Previous Crop: Wheat. FIELD PREPARATION: No-till.

Summary: Growing Season Precipitation and Temperature Chivington, Kiowa County.<sup>a</sup>

Month	Rainfall	GDD <sup>b</sup>	>90 F	>100 F	DAP <sup>c</sup>
	In		-----no. of days-----		
June	4.92	509	14	0	21
July	1.28	810	21	8	52
August	1.28	767	23	0	83
September	0.14	638	16	1	113
October	0.03	208	1	0	129
Total	7.65	2932	75	9	129

<sup>a</sup>Growing season from June 9 (planting) to October 16 (first freeze, 25 F).

<sup>b</sup>GDD: Growing Degree Days for sorghum.

<sup>c</sup>DAP: Days After Planting.

COMMENTS: Planted in good soil moisture. Weed control was excellent. Precipitation for the growing season was well above the average of the past 29 years. May and June were very wet, but the rest of the monthly precipitation totals for the growing season were below their long term averages. Yields and test weights were excellent.

SOIL: Sandy loam for 0-8" and sandy loam 8"-24" depths from soil analysis.

Summary: Soil Analysis of Plant Available Nutrients.

Depth	pH	Salts	OM	N	P	K	Zn	S
		mmhos/cm	%	-----ppm-----				
0-8"	8.2	0.3	1.4	2	9.0	363	0.7	8.5
8"-24"				5				
Comment	Alka	VLo	Mod	Lo	Med	VHi	Lo	Lo

Iron was marginal.

Summary: Fertilization.

Fertilizer	N	P <sub>2</sub> O <sub>5</sub>	Zn	S
	-----lb/a-----			
Recommended	10	0	2	20
Applied	50	20	0	9

Yield Goal: 40 bu/a.

Actual Yield: 75 bu/a.

### Available Soil Water Dryland Grain Sorghum, Brandon, 2015

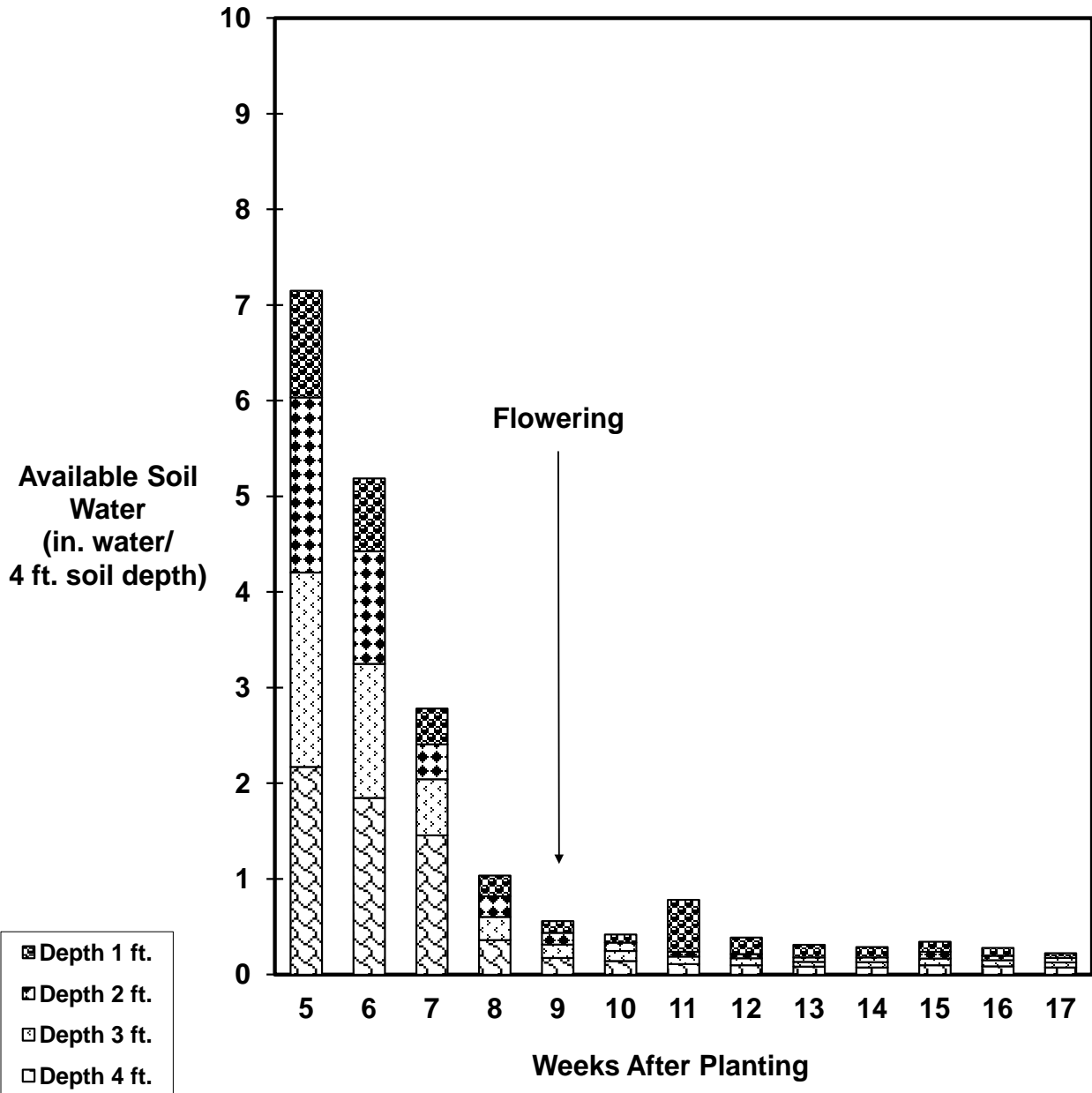


Fig. 1. Available soil water in dryland grain sorghum at Brandon. Gypsum block measurements taken to 4 ft. with 1 ft. increments. Total rainfall at Brandon from planting to first freeze was 7.66 in. Any increase in available soil water between weeks is from rain.

### 2015 Dryland Grain Sorghum Hybrid Performance Trial at Brandon

Brand	Hybrid	Grain Yield <sup>a</sup> bu/ac	Yield		Lodging percent	Harvest Plant Population plants/ac	Plant Height in	50% Bloom days after planting	GDD <sup>b</sup>	50% Mature days after planting	Maturity Group <sup>c</sup>
			Percent of Trial Average percent	Test Weight lb/bu							
Dekalb	DKS28-05	82.5	111	58.3	4	28,100	43	58	1484	96	E
Mycogen Seeds	1G557	81.8	110	58.0	0	27,700	39	56	1425	95	E
Dekalb	DKS29-28	79.6	107	59.1	0	28,600	38	55	1399	94	E
Alta Seeds	AG1101	77.6	104	58.8	0	26,800	38	54	1373	93	E
Dekalb	DK28E	74.1	100	58.8	0	28,100	38	53	1344	92	E
Gayland Ward Seed	GW-1180	88.4	119	57.9	2	25,800	42	62	1597	103	ME
Heartland Genetics	HG44R	86.9	117	59.3	0	26,300	39	65	1681	106	ME
Alta Seeds	AG1201	85.3	115	58.3	1	27,000	37	62	1597	102	ME
Mycogen Seeds	1G588	77.1	104	57.8	3	25,400	47	63	1621	101	ME
Sorghum Partners	K35Y5	76.1	102	58.7	0	24,200	41	62	1597	100	ME
Heartland Genetics	HG23R	72.1	97	59.0	0	23,700	42	65	1681	105	ME
Alta Seeds	AG1203	71.3	96	60.8	1	22,700	46	66	1709	107	ME
Alta Seeds	AG2105	80.8	109	59.1	2	26,000	46	67	1741	108	M
Alta Seeds	AG2115	76.2	103	59.2	1	26,100	46	67	1741	108	M
Gayland Ward Seed	GW-1160	47.8	64	58.6	0	24,600	49	68	1771	108	M
Heartland Genetics	HG33C	63.3	85	57.2	0	26,700	42	72	1837	115	ML
Gayland Ward Seed	GW-9417	52.5	71	57.6	17	23,900	49	73	1862	116	ML
<b>Average</b>		<b>74.9</b>		<b>58.6</b>	<b>2</b>	<b>26,000</b>	<b>42</b>	<b>63</b>	<b>1615</b>	<b>103</b>	<b>ME</b>

<sup>e</sup>LSD (P<0.20)

8.7

3

<sup>a</sup>Yields adjusted to 14% moisture and hybrids ranked by yield within maturity group.

<sup>b</sup>GDD: Growing degree-days to 50% bloom date.

<sup>c</sup>Maturity Group: E=early; ME=medium-early; M=medium; ML=medium late.

<sup>d</sup>Days after planting or maturation of seed at first freeze.

<sup>e</sup>If the difference between two varieties yields equals or exceeds the LSD value, there is an 80% chance the difference is significant.

**Table 4. Summary: Dryland Grain Sorghum Hybrid Performance Trials at Brandon, 2013-2015.**

Brand	Hybrid	Maturity Group <sup>a</sup>	Grain Yield					Yield as % of Test Average				
			2013	2014	2015	2-Year Avg	3-Year Avg	2013	2014	2015	2-Year Avg	3-Year Avg
Alta Seeds	AG1101	E	17	13	78	46	36	119	71	104	97	100
Alta Seeds	AG1201	E	17	25	85	55	42	114	135	115	117	118
Alta Seeds	AG1203	ME	--	24	71	48	--	--	134	96	101	--
Dekalb	DKS29-28	E	24	13	80	47	39	166	71	107	99	108
Dekalb	DKS28-05	E	12	22	83	53	39	84	123	111	112	108
Mycogen Seeds	1G557	E	18	17	82	50	39	124	93	110	105	108
Mycogen Seeds	1G588	ME	--	24	77	51	--	--	133	104	107	--
<b>Average</b>			<b>15</b>	<b>18</b>	<b>75</b>	<b>47</b>	<b>36</b>					

<sup>a</sup>Maturity Group: E=early; ME=medium early.

Grain Yields were adjusted to 14.0% seed moisture content.

## Dryland Grain Sorghum Hybrid Performance Trial at Walsh, 2015

COOPERATOR: Plainsman Agri-Search Foundation, Walsh, Colorado.

PURPOSE: To identify high yielding hybrids under dryland conditions with 3300 sorghum heat units in a silt loam soil.

PLOT: Four rows with 30 in. row spacing, 50 ft. long. SEEDING DENSITY: 43,600 seed/a. PLANTED: June 8. HARVESTED: November 9.

PEST CONTROL: Preemergence Herbicides: Atrazine 1lb/a, S-Metolachlor 21 oz/a, Glyphosate, 32 oz/a; 2,4-D, 0.5 lb/a, Banvel 4 oz/a. Post Emergence Herbicides: Huskie 16 oz/a, Atrazine 0.75 lb/a, AMS 1 lb/a. Cultivation: None. Insecticides: None.

FIELD HISTORY: Previous Crop: Wheat. FIELD PREPARATION: Strip-till.

Summary: Growing Season Precipitation and Temperature Walsh, Baca County.<sup>a</sup>

Month	Rainfall	GDD <sup>b</sup>	>90 F	>100 F	DAP <sup>c</sup>
	In		-----no. of days-----		
June	1.23	555	14	1	22
July	5.54	846	20	1	53
August	2.68	803	19	0	84
September	1.05	680	17	1	114
October	2.93	355	1	0	145
November	0.30	69	0	0	152
Total	13.73	3308	71	3	152

<sup>a</sup>Growing season from June 8 (planting) to November 7 (first freeze, 28 F).

<sup>b</sup>GDD: Growing Degree Days for sorghum.

<sup>c</sup>DAP: Days After Planting.

COMMENTS: Planted in good soil moisture for seed germination and plant stand. Weed control was excellent. No greenbug infestation. The growing season precipitation was above average. May and July were wet. Very long growing season with the first freeze date on November 7. Hybrids at this site had to recover from two hailstorms: one on June 11 reduced plant populations and one on August 18 stripped leaves and damaged stalks and heads. Grain yields and test weights were good despite damage from two hailstorms.

SOIL: Richfield silt loam for 0-8" and silt loam 8"-24" depths from soil analysis.

Summary: Soil Analysis of Plant Available Nutrients.								
Depth	pH	Salts	OM	N	P	K	Zn	S
		mmhos/cm	%	-----ppm-----				
0-8"	7.6	1.2	1.9	46	3.7	420	0.5	16.8
8"-24"				53				
Comment	Alka	Lo	Hi	VHi	Lo	VHi	Lo	Lo
Iron was marginal.								

Summary: Fertilization.				
Fertilizer	N	P <sub>2</sub> O <sub>5</sub>	Zn	S
	-----lb/a-----			
Recommended	0	20	2	10
Applied	50	20	0	0
Yield Goal: 40 bu/a.				
Actual Yield: 39 bu/a.				

**Available Soil Water  
Dryland Grain Sorghum, Walsh, 2015**

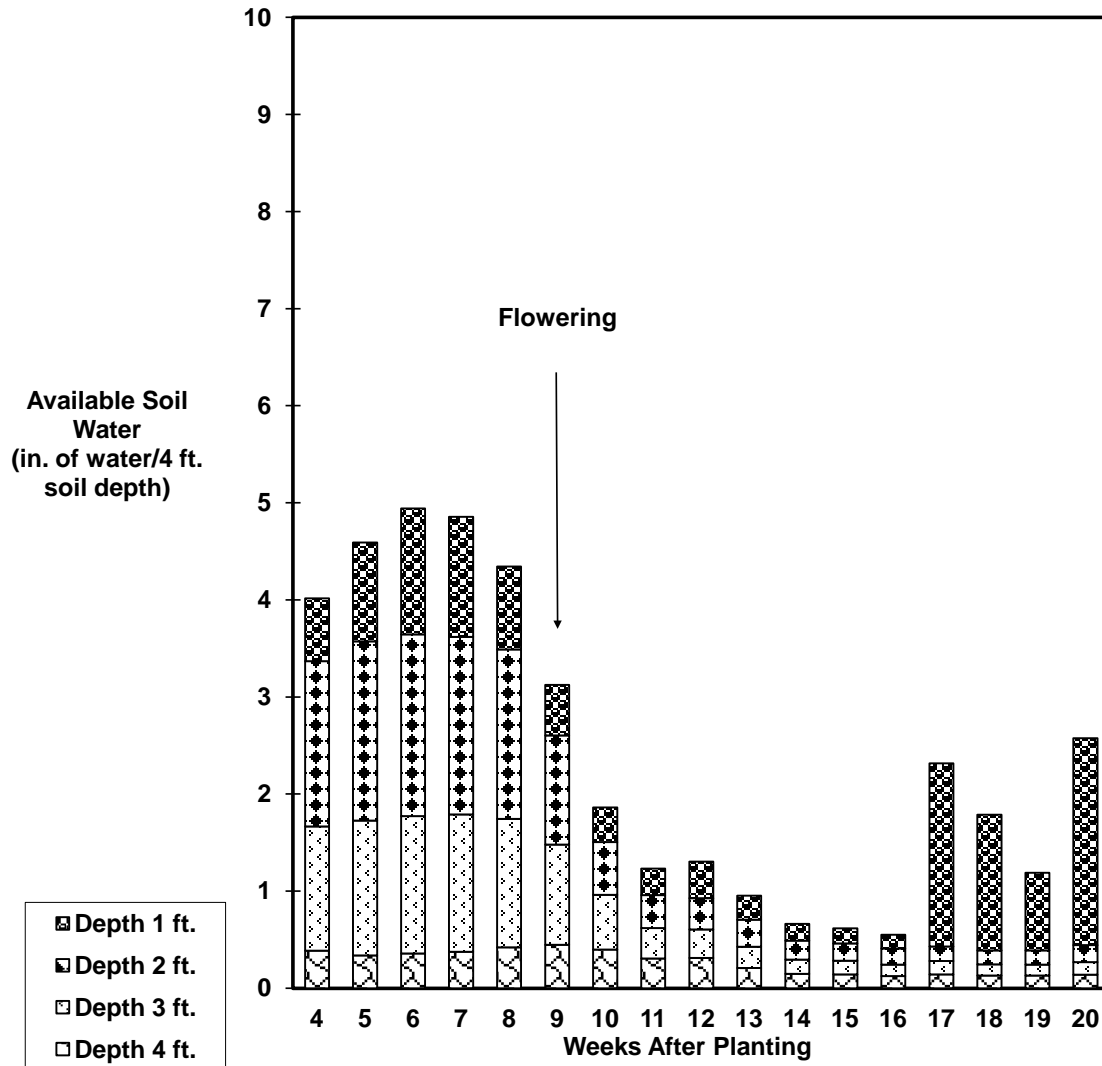


Fig. 2. Available soil water in dryland grain sorghum at Walsh. Gypsum block measurements taken to 4 ft. with 1 ft. increments. Total rainfall at Walsh from planting to first freeze was 13.73 in. Any increase in available soil water between weeks is from rain.



**2015 Dryland Grain Sorghum Hybrid Performance Trial at Walsh.**

Source	Hybrid	Grain Yield <sup>a</sup>	Yield	Test Weight	Lodging	Harvest Plant Population	Plant Height	50% Bloom	GDD <sup>b</sup>	50% Mature	Maturity Group <sup>c</sup>
			Percent of Trial Average								
		bu/ac	percent	lb/bu	percent	plants/ac	in	days after planting	days after planting <sup>d</sup>		
Mycogen Seeds	1G557	48.9	125	57.5	4	20,700	41	60	1596	104	E
Alta Seeds	AG1101	40.6	104	57.2	2	18,400	39	59	1562	103	E
Dekalb	DKS29-28	37.0	95	57.4	4	20,900	36	61	1628	103	E
Dekalb	DKS28-05	34.0	87	57.4	10	18,400	46	61	1628	106	E
Richardson Seeds	Swift	18.7	48	54.3	5	21,300	37	54	1425	98	E
Gayland Ward Seed	GW-1180	54.8	140	57.8	8	17,600	46	66	1763	110	ME
Dekalb	DKS38-88	50.9	130	58.4	7	21,100	48	67	1791	112	ME
Richardson Seeds	RS215	44.5	114	58.4	4	16,800	48	69	1852	113	ME
Alta Seeds	AG1201	43.9	112	57.4	6	16,300	40	64	1710	108	ME
Sharp Brothers	Sprint II	41.7	107	58.4	12	19,400	45	63	1685	108	ME
Alta Seeds	AG1203	38.4	98	59.8	12	18,200	43	69	1852	113	ME
Sorghum Partners	K35Y5	27.7	71	58.8	10	16,700	42	63	1685	107	ME
Alta Seeds	AG2115	41.7	107	58.1	6	16,300	41	71	1904	115	M
Alta Seeds	AG2105	31.7	81	58.0	30	19,400	45	70	1881	114	M
Gayland Ward Seed	GW-1160	30.1	77	58.1	1	20,700	46	71	1904	117	M
Gayland Ward Seed	GW-9417	40.7	104	58.6	8	19,800	51	77	1981	120	ML
<b>Average</b>		<b>39.1</b>		<b>57.9</b>	<b>8</b>	<b>18,900</b>	<b>43</b>	<b>65</b>	<b>1740</b>	<b>109</b>	<b>ME</b>

<sup>e</sup>LSD (P<0.20)

9.5

5

<sup>a</sup>Yields adjusted to 14% moisture and hybrids ranked by yield within maturity group.

<sup>b</sup>GDD: Growing degree-days to 50% bloom date.

<sup>c</sup>Maturity Group: E=early; ME=medium-early; M=medium; ML=medium late.

<sup>d</sup>Days after planting.

<sup>e</sup>If the difference between two varieties yields equals or exceeds the LSD value, there is an 80% chance the difference is significant.

**Table 6. Summary: Dryland Grain Sorghum Hybrid Performance Trials at Walsh, 2013-2015.**

Brand	Hybrid	Maturity Group <sup>a</sup>	Grain Yield					Yield as % of Test Average				
			2013	2014	2015	2-Year Avg	3-Year Avg	2013	2014	2015	2-Year Avg	3-Year Avg
Alta Seeds	AG1101	E	3	44	41	43	29	71	91	104	97	95
Alta Seeds	AG1201	E	5	55	44	50	35	100	114	112	113	112
Alta Seeds	AG1203	ME	--	54	38	46	--	--	111	98	105	--
Dekalb	DKS38-88	ME	4	68	51	60	41	77	142	130	135	132
<b>Average</b>			<b>5</b>	<b>48</b>	<b>39</b>	<b>44</b>	<b>31</b>					

<sup>a</sup>Maturity Group: E=early; ME=medium early.

Grain Yields were adjusted to 14.0% seed moisture content.

## Dryland Forage Sorghum Performance Trial at Walsh, 2015

COOPERATOR: Plainsman Agri-Search Foundation, Walsh, Colorado.

PURPOSE: To identify high yielding hybrids under dryland conditions with 3100 sorghum heat units in a silt loam soil.

PLOT: Four rows with 30 in. row spacing, 50 ft. long. SEEDING DENSITY: 69,700 seed/a. PLANTED: June 8. HARVESTED: October 16.

PEST CONTROL: Preemergence Herbicides: Atrazine 1 lb/a, S-Metolachlor 21 oz/a, Glyphosate 32 oz/a, 2,4-D 0.5 lb/a, Dicamba 4 oz/a. Post Emergence Herbicides: Huskie 16 oz/a, Atrazine 0.75 lb/a, AMS 1 lb/a. Cultivation: None. Insecticides: None.

FIELD HISTORY: Previous Crop: Wheat. FIELD PREPARATION: Strip-till.

Summary: Growing Season Precipitation and Temperature Walsh, Baca County.<sup>a</sup>

Month	Rainfall	GDD <sup>b</sup>	>90 F	>100 F	DAP <sup>c</sup>
	In		-----no. of days-----		
June	1.23	555	14	1	22
July	5.54	846	20	1	53
August	2.68	803	19	0	84
September	1.05	680	17	1	114
October	0.12	215	1	0	130
Total	10.62	3099	71	3	130

<sup>a</sup>Growing season from June 8 (planting) to October 16 (harvest).

<sup>b</sup>GDD: Growing Degree Days for sorghum.

<sup>c</sup>DAP: Days After Planting.

COMMENTS: Planted in good soil moisture for seed germination and plant stand. Weed control was excellent. No greenbug infestation. The growing season precipitation was above average. May and July were wet. Hybrids at this site had to recover from two hailstorms: one on June 11 reduced plant populations and one on August 18 stripped leaves and damaged and broke stalks. Forage yields were fair despite damage from two hailstorms.

SOIL: Richfield silt loam for 0-8" and silt loam 8"-24" depths from soil analysis.

Summary: Soil Analysis of Plant Available Nutrients.

Depth	pH	Salts	OM	N	P	K	Zn	S
		mmhos/cm	%	-----ppm-----				
0-8"	7.7	0.9	2.1	56	4.9	466	0.9	16.2
8"-24"				45				
Comment	Alka	VLo	Hi	VHi	Lo	VHi	Lo	Lo
Iron was marginal.								

Summary: Fertilization.

Fertilizer	N	P <sub>2</sub> O <sub>5</sub>	Zn	S
	-----lb/a-----			
Recommended	0	20	2	10
Applied	50	20	0	0
Yield Goal: 8 tons/a.				
Actual Yield: 6.4 tons/a.				

**Available Soil Water  
Dryland Forage Sorghum, Walsh, 2015**

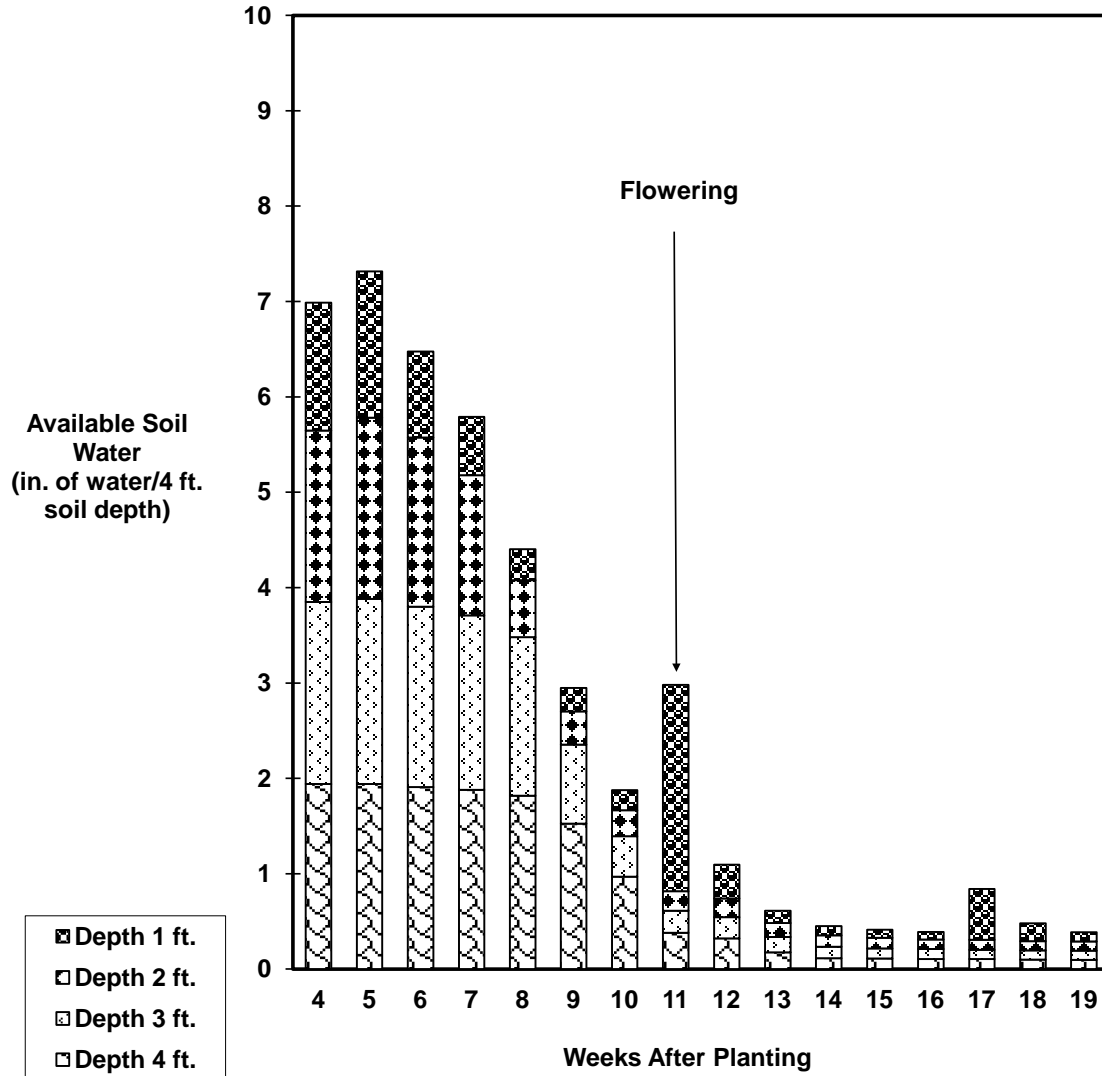


Fig. 3. Available soil water in dryland forage sorghum at Walsh. Gypsum block measurements taken to 4 ft. with 1 ft. increments. Total rainfall at Walsh from planting to harvest was 10.62 in. Any increase in available soil water between weeks is from rain.

### 2015 Dryland Hybrid Forage Variety Performance Trial at Walsh

Brand	Hybrid	Forage Yield <sup>a</sup>	Yield	Stem Sugar	Harvest Density	Plant Height	Lodging	Days to Boot	Relative Maturity <sup>b</sup>	Forage Type <sup>c</sup>	Traits
		tons/ac	% of test avg.	%	plants/ac (1000 x)	in	%	days after planting			
Walter Moss Seed Co.	4EVER GREEN	8.8	138	12.1	22.1	75	0	70	PS	FS	-
Alta Seeds	AF7202	8.5	134	8.7	21.9	63	8	70	ME	FS	BMR-6, BD
Gayland Ward Seed	Sweet Forever BMR	8.2	129	14.9	24.6	84	0	81	PS	SS	BMR, BD
Walter Moss Seed Co.	MEGA GREEN	7.9	124	12.5	22.5	79	1	93	PS	SS	-
Alta Seeds	AF7401	7.8	122	12.6	25.9	36	0	97	L	FS	BMR-6, BD
Gayland Ward Seed	GW-600 BMR	7.7	121	10.9	26.5	60	7	77	M	FS	BMR-6
Gayland Ward Seed	Super Sugar	7.7	120	18.4	23.4	79	4	62	ME	SS	-
Alta Seeds	AS5201	6.9	108	18.8	22.9	77	15	63	M	SS	-
Gayland Ward Seed	Super Sugar (delayed mat.)	6.9	108	14.2	22.1	66	0	90	L	SS	-
Alta Seeds	AS9302	6.4	101	8.3	22.5	71	1	66	M	S	BMR-6, BD, DS
Alta Seeds	AF7102	6.4	100	8.6	22.3	65	7	65	E	FS	BMR-6, BD
Gayland Ward Seed	GW-2120	6.2	97	11.1	25.0	75	18	64	M	FS	MS
Alta Seeds	AS6402	6.2	97	8.1	20.0	55	0	85	L	SS	BMR-6, BD
Gayland Ward Seed	Silo Pro BMR	6.2	97	19.6	24.8	57	0	78	ML	FS	BMR-6
Alta Seeds	AF7301	5.6	87	6.3	25.0	57	2	73	M	FS	BMR-6, MS
Alta Seeds	AF7101	5.4	85	8.6	25.2	59	8	71	E	FS	BMR-6, DS
Gayland Ward Seed	GW-400 BMR	4.9	76	8.9	25.6	70	9	63	ME	FS	BMR-6, MS
Gayland Ward Seed	Nutra King BMR 6	4.4	69	13.6	25.2	68	18	61	ME	SS	BMR-6
Gayland Ward Seed	Sweet Six BMR (dry stalk)	4.4	69	12.9	25.2	64	5	63	E	SS	BMR, DS
Alta Seeds	AF7201	3.8	59	9.9	20.9	69	10	71	ME	FS	BMR-6, DS
Mycogen	2C799 (corn)	3.7	58	10.9	18.4	66	0	66	M	Corn	-
<b>Average</b>		<b>6.4</b>		<b>11.9</b>	<b>23.4</b>	<b>66</b>	<b>5</b>	<b>73</b>			

<sup>e</sup>LSD (P<0.20)

1.3

<sup>a</sup>Yields are adjusted to 70% moisture content based on oven-dried samples.

<sup>b</sup>Relative Maturity: E=early; ME=medium-early; M=medium; ML=medium-late; L=late; PS=photoperiod sensitive.

<sup>c</sup>Forage Type: FS=forage sorghum; S=sudangrass; SS=sorghum sudangrass.

<sup>d</sup>Traits: BD=brachytic dwarf; BMR=brown mid-rib; BMR-6=one of the three main brown mid-rib genes; DS=dry stalk; MS=male sterile.

<sup>e</sup>If the difference between two varieties yields equals or exceeds the LSD value, there is a 80% chance the difference is significant.

## 2015 Dryland Hybrid Forage Variety Performance Trial Dry Matter Analysis at Walsh

Brand	Hybrid	Forage Type <sup>a</sup>	RFQ	CP	ADF	NDF	NDFD	IVTDMD	TDN	Net Energy		
										Main.	Gain	Lact.
										MCal/lb		
Alta Seeds	AF7201	FS	166	12.6	30.2	59.9	72	80.9	68.1	0.72	0.44	0.70
Gayland Ward Seed	Silo Pro BMR	FS	164	17.2	26.2	53.8	71	82.0	72.7	0.78	0.50	0.76
Alta Seeds	AF7101	FS	162	14.3	29.3	58.9	72	81.6	69.1	0.73	0.46	0.72
Alta Seeds	AF7301	FS	161	13.4	29.6	59.0	71	80.4	68.8	0.73	0.45	0.71
Alta Seeds	AF7401	FS	158	9.3	29.5	53.4	71	83.2	68.9	0.73	0.45	0.71
Alta Seeds	AF7202	FS	156	12.1	31.3	60.8	69	78.6	66.9	0.70	0.43	0.69
Alta Seeds	AS6402	SS	152	11.2	31.7	60.1	67	77.2	66.4	0.69	0.42	0.69
Alta Seeds	AF7102	FS	151	15.0	32.2	60.7	71	80.7	65.9	0.68	0.41	0.68
Walter Moss Seed Co.	4EVER GREEN	FS	150	11.2	29.3	56.6	64	76.8	69.2	0.73	0.46	0.72
Gayland Ward Seed	GW-400 BMR	FS	148	18.2	28.5	55.0	72	83.0	70.1	0.74	0.47	0.73
Gayland Ward Seed	Sweet Six BMR (dry stalk)	SS	148	16.4	29.1	60.6	67	78.5	69.4	0.73	0.46	0.72
Gayland Ward Seed	Super Sugar (delayed mat.)	SS	146	9.9	31.6	56.1	64	76.8	66.5	0.69	0.42	0.69
Gayland Ward Seed	GW-600 BMR	FS	146	15.9	28.9	58.5	68	80.0	69.6	0.74	0.46	0.72
Gayland Ward Seed	Nutra King BMR 6	SS	143	15.9	32.2	61.0	68	78.0	65.9	0.68	0.41	0.68
Gayland Ward Seed	GW-2120	FS	142	16.7	31.6	61.4	68	79.1	66.5	0.69	0.42	0.69
Gayland Ward Seed	Sweet Forever BMR	SS	142	11.2	33.5	66.8	65	76.7	64.4	0.66	0.39	0.66
Alta Seeds	AS5201	SS	129	13.2	36.0	66.2	61	72.7	61.6	0.62	0.36	0.63
Gayland Ward Seed	Super Sugar	SS	127	17.0	32.7	60.8	62	75.8	65.3	0.67	0.41	0.67
Walter Moss Seed Co.	MEGA GREEN	SS	126	11.6	33.4	61.0	55	71.2	64.5	0.66	0.40	0.66
Alta Seeds	AS9302	S	125	21.0	29.9	54.8	71	83.7	68.5	0.72	0.45	0.71
Mycogen	2C799 (corn)	Corn	116	16.1	35.0	65.3	58	73.4	62.6	0.63	0.37	0.64
<b>Average</b>			<b>146</b>	<b>14.3</b>	<b>31.0</b>	<b>59.6</b>	<b>67</b>	<b>78.6</b>	<b>67.2</b>	<b>0.70</b>	<b>0.43</b>	<b>0.69</b>

<sup>a</sup>Forage Type: FS=forage sorghum; S=sudangrass; SS=sorghum sudangrass.

RFQ= relative feed quality; CP=crude protein; ADF=acid detergent fiber; NDF=neutral detergent fiber; NDFD=neutral detergent fiber digestibility (48 hr); IVTDMD=in vitro total dry matter digestibility (48 hr); TDN=total digestible nutrients; Main.=maintenance; Lact.=lactation.

## Irrigated Forage Sorghum Hybrid Performance Trial at Rocky Ford, 2015

COOPERATOR: Arkansas Valley Research Center.

PURPOSE: To identify high yielding hybrids under irrigated conditions with 2550 sorghum heat units in a silty clay loam soil.

PLOT: Four rows with 30 in. row spacing, 35 ft. long. SEEDING DENSITY: 113,250 seed/a. PLANTED: June 1. HARVESTED: September 10.

IRRIGATION: Four furrow irrigations: June 10, July 7, July 31 and August 21, total applied 24 a-in./a.

PEST CONTROL: Preemergence Herbicides: Post Emergence Herbicides: WeedMaster 16 oz/a. Cultivation: None. Insecticides: None.

SOIL: Rocky Ford silty clay loam.  
FERTILIZER: 18-46-0 at 135 lb/a.

FIELD HISTORY: Previous Crop: Onion. FIELD PREPARATION: No-till.

COMMENTS: Planted in adequate soil moisture for seed germination and stand establishment. Weed control was good. The growing season precipitation was below average, because July was dry. The forage yields were excellent.

Summary: Growing Season Precipitation and Temperature  
Rocky Ford, Otero County.<sup>a</sup>

Month	Rainfall	GDD <sup>b</sup>	>90 F	>100 F	DAP <sup>c</sup>
	In		-----no. of days-----		
June	1.07	690	15	0	30
July	0.33	802	18	0	61
August	1.07	790	20	1	92
September	0.00	259	9	0	102
Total	2.47	2541	62	1	102

<sup>a</sup>Growing season from June 1 (planting) to September 10 (harvest).

<sup>b</sup>GDD: Growing Degree Days for sorghum.

<sup>c</sup>DAP: Days After Planting.

**2015 Irrigated Hybrid Forage Sorghum Performance Trial at Rocky Ford**

Brand	Hybrid	Forage		Stem Sugar	Harvest Density	Plant Height	Plant Lodging	Days to Boot	Relative Maturity <sup>b</sup>	Forage Type <sup>c</sup>	Traits <sup>d</sup>
		Yield <sup>a</sup> tons/ac	Yield % of test average								
Sorghum Partners	SPX28414	50.0	157	12.5	73.0	125	0	81	L	FS	-
Sorghum Partners	SS405	46.7	147	7.5	73.0	119	0	81	L	FS	-
Walter Moss Seed Co.	MEGA GREEN	44.6	140	12.5	107.8	122	0	82	PS	SS	-
Walter Moss Seed Co.	4EVER GREEN	43.1	135	6.0	100.7	116	0	82	PS	FS	-
Sorghum Partners	SP1615	41.7	131	12.0	75.1	113	0	82	PS	FS	-
Gayland Ward Seed	Super Sugar	40.9	128	14.0	154.1	110	0	69	ME	SS	-
Pawnee Buttes Seed	PB Arikaree	37.8	119	14.0	112.7	113	0	82	L	SS	-
Gayland Ward Seed	Super Sugar (delayed mat.)	37.5	118	12.0	116.5	115	0	82	L	SS	-
Gayland Ward Seed	Sweet Six BMR (dry stalk)	37.1	117	13.5	124.7	122	1	68	E	SS	BMR, DS
Alta Seeds	AF7101	35.7	112	12.0	71.9	107	1	68	E	FS	BMR-6, DS
Alta Seeds	AS5201	35.6	112	13.5	131.8	116	3	71	M	SS	-
Gayland Ward Seed	Sweet Forever BMR	35.2	110	8.5	111.6	118	0	83	PS	SS	BMR, BD
Gayland Ward Seed	GW-600 BMR	35.0	110	13.0	79.5	111	3	68	M	FS	BMR-6
Gayland Ward Seed	GW-2120	33.3	105	6.5	98.0	103	0	68	M	FS	MS
Gayland Ward Seed	GW-400 BMR	32.9	103	13.5	81.7	108	0	81	ME	FS	BMR-6, MS
Gayland Ward Seed	Nutra King BMR 6	32.5	102	12.0	110.5	113	15	68	ME	SS	BMR-6
Alta Seeds	AF7201	32.4	102	12.5	70.2	109	3	69	ME	FS	BMR-6, DS
Sorghum Partners	NK300	30.9	97	12.0	80.6	80	0	67	M	FS	-
Pawnee Buttes Seed	PB EXP 5143	29.9	94	13.0	78.4	88	0	70	ML	FS	-
Alta Seeds	AF7301	25.4	80	13.5	76.2	109	0	69	M	FS	BMR-6, MS
Gayland Ward Seed	Silo Pro BMR	24.7	78	10.5	77.3	73	0	71	ML	FS	BMR-6
Alta Seeds	AF7202	23.8	75	11.5	83.9	79	0	67	ME	FS	BMR-6, BD
Pawnee Buttes Seed	PB Arapahoe	22.7	71	12.5	65.9	106	4	68	ME	SS	BMR
Alta Seeds	AF7102	22.4	70	5.0	74.1	82	0	67	E	FS	BMR-6, BD
Alta Seeds	AS9302	19.9	63	13.0	108.4	90	0	69	M	S	BMR-6, BD, DS
Sorghum Partners	SP3903 BD	19.6	62	4.5	77.9	74	0	68	ML	FS	BMR, BD
Alta Seeds	AS6402	19.6	62	14.5	99.6	78	0	83	L	SS	BMR-6, BD
Alta Seeds	AF7401	19.4	61	4.5	84.4	71	0	81	L	FS	BMR-6, BD
Sorghum Partners	SPX37114	12.7	40	4.0	76.8	55	0	68	PS	FS	-
<b>Average</b>		<b>31.8</b>		<b>10.8</b>	<b>92.3</b>	<b>101</b>	<b>1</b>	<b>72</b>			

<sup>e</sup>LSD (P<0.20)

5.0

<sup>a</sup>Yields are adjusted to 70% moisture content based on oven-dried samples.

<sup>b</sup>Relative Maturity: E=early; ME=medium-early; M=medium; ML=medium-late; L=late; PS=photoperiod sensitive.

<sup>c</sup>Forage Type: FS=forage sorghum; S=sudangrass; SS=sorghum sudangrass.

<sup>d</sup>Traits: BD=brachytic dwarf; BMR=brown mid-rib; BMR-6=one of the three main brown mid-rib genes; DS=dry stalk; MS=male sterile.

<sup>e</sup>If the difference between two varieties yields equals or exceeds the LSD value, there is an 80% chance the difference is significant.



### 2015 Irrigated Hybrid Forage Sorghum Performance Trial Dry Matter Analysis at Rocky Ford

Brand	Hybrid <sup>a</sup>	Forage Type <sup>b</sup>	RFQ	CP	ADF	NDF	NDFD	IVTDMD	TDN	Net Energy		
										Main.	Gain	Lact.
										MCal/lb		
Alta Seeds	AF7301	FS	150	8.8	27.5	48.2	62	78.6	71.2	0.76	0.48	0.74
Gayland Ward Seed	GW-400 BMR	FS	144	7.4	25.7	43.9	54	76.3	73.3	0.79	0.51	0.76
Gayland Ward Seed	GW-2120	FS	140	7.2	22.8	38.1	46	74.6	76.6	0.84	0.55	0.80
Alta Seeds	AF7201	FS	140	7.8	25.3	44.5	50	75.3	73.7	0.79	0.51	0.77
Gayland Ward Seed	Nutra King BMR 6	SS	139	7.5	23.8	40.5	42	72.1	75.5	0.82	0.54	0.79
Gayland Ward Seed	Super Sugar	SS	137	8.2	26.7	44.2	43	70.8	72.2	0.77	0.49	0.75
Alta Seeds	AF7101	FS	136	7.9	25.9	46.4	49	73.8	73.0	0.78	0.50	0.76
Gayland Ward Seed	Silo Pro BMR	FS	136	9.6	30.0	55.7	60	75.0	68.3	0.72	0.45	0.71
Alta Seeds	AF7202	FS	133	7.2	23.5	40.5	48	75.8	75.8	0.82	0.54	0.79
Gayland Ward Seed	GW-600 BMR	FS	131	7.5	31.6	54.0	57	74.3	66.5	0.69	0.42	0.69
Sorghum Partners	SPX37114	FS	130	9.8	28.8	51.5	53	75.5	69.8	0.74	0.46	0.72
Alta Seeds	AS9302	S	128	6.7	21.4	40.8	46	75.7	78.2	0.86	0.57	0.82
Pawnee Buttes Seed	PB EXP 5143	FS	127	7.4	25.2	43.2	46	73.6	73.8	0.80	0.52	0.77
Pawnee Buttes Seed	PB Arapahoe	SS	126	7.7	29.3	49.5	45	70.8	69.1	0.73	0.46	0.72
Alta Seeds	AF7401	FS	124	8.9	32.2	55.4	55	73.2	65.8	0.68	0.41	0.68
Alta Seeds	AF7102	FS	123	6.7	25.6	42.8	45	74.1	73.3	0.79	0.51	0.76
Alta Seeds	AS6402	SS	122	10.3	37.0	63.3	59	72.5	60.3	0.60	0.34	0.62
Sorghum Partners	NK300	FS	121	7.5	27.4	47.6	44	70.8	71.3	0.76	0.48	0.74
Alta Seeds	AS5201	SS	120	6.8	28.8	48.7	41	67.5	69.7	0.74	0.46	0.72
Gayland Ward Seed	Sweet Six BMR (dry stalk)	SS	119	6.9	30.0	50.9	42	67.9	68.3	0.72	0.45	0.71
Pawnee Buttes Seed	PB Arikaree	SS	114	7.1	36.9	60.2	52	68.5	60.5	0.60	0.34	0.62
Gayland Ward Seed	Sweet Forever BMR	SS	108	5.7	37.6	65.6	56	70.0	59.7	0.59	0.33	0.61
Sorghum Partners	SP3903 BD	FS	107	9.3	35.7	63.9	54	69.7	61.8	0.62	0.36	0.63
Sorghum Partners	SS405	FS	97	6.4	38.2	64.4	44	62.9	59.0	0.58	0.32	0.60
Gayland Ward Seed	Super Sugar (delayed mat.)	SS	94	7.2	40.6	65.5	46	63.6	56.3	0.54	0.28	0.57
Sorghum Partners	SPX28414	FS	92	5.9	41.7	71.6	47	62.0	55.1	0.52	0.27	0.56
Walter Moss Seed Co.	4EVER GREEN	FS	84	7.3	41.0	71.0	46	62.2	55.8	0.53	0.28	0.57
Sorghum Partners	SP1615	FS	74	6.3	43.2	73.2	42	59.4	53.3	0.49	0.24	0.54
Walter Moss Seed Co.	MEGA GREEN	SS	67	6.0	46.0	74.2	40	58.1	50.1	0.44	0.19	0.50
<b>Average</b>			<b>119</b>	<b>7.6</b>	<b>31.4</b>	<b>53.8</b>	<b>49</b>	<b>70.5</b>	<b>66.8</b>	<b>0.69</b>	<b>0.42</b>	<b>0.69</b>

<sup>a</sup>Hybrids ranked according to relative feed quality score (RFQ)

<sup>b</sup>Forage Type: FS=forage sorghum; S=sudangrass; SS=sorghum sudangrass

RFQ=relative forage quality; CP=crude protein; ADF=acid detergent fiber; NDF=neutral detergent fiber; NDFD=neutral detergent fiber digestibility (48 hr); IVTDMD=in vitro total dry matter digestibility (48 hr); TDN=total digestible nutrients; Main.=maintenance; Lact.=lactation.