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Extension

2023 Sorghum Hybrid Performance Trials in Colorado

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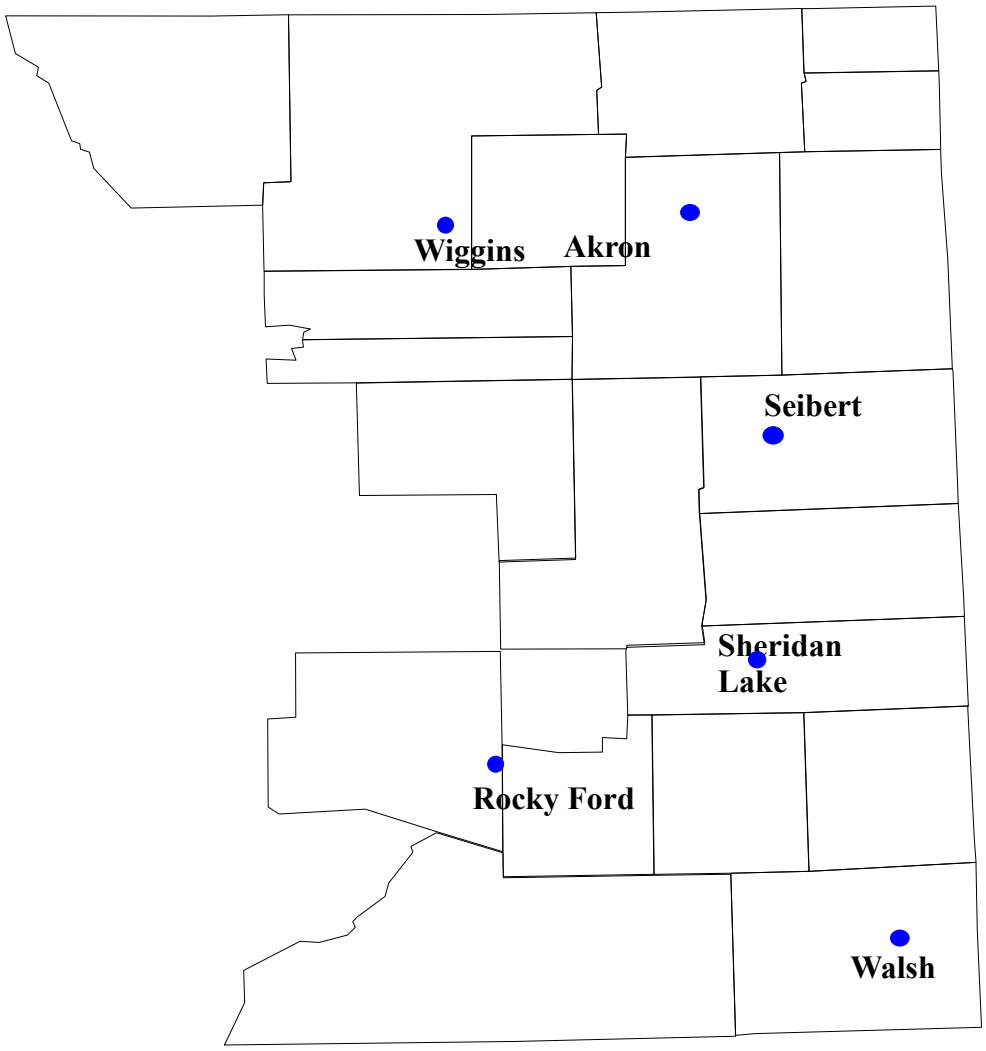
2023 SORGHUM HYBRID PERFORMANCE TRIALS IN COLORADO

2023 Sorghum Trial Testing Locations
(Fruita not shown)



SORGHUM HYBRID PERFORMANCE TRIALS IN COLORADO, 2023

K.J. Larson, S.M. Jones-Diamond, K.J. Tanabe, S. Pinnamaneni, B.T. Pettinger, and Z.S. Jenkins

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 six sites across Colorado: Akron, Rocky Ford, Seibert, Sheridan Lake, Walsh, and Wiggins. Forage sorghum trials were conducted at three sites: Fruita (irrigated), Rocky Ford (irrigated), and Walsh (dryland).

The 2023 Colorado grain sorghum crop is estimated at 20.3 million bushels, up 12.7 million bushels from the 2022 sorghum crop of 7.60 million bushels. The 2023 sorghum crop is the third largest crop raised in the last 10 years due in part to the second highest number of harvested acres, 405,000 acres, in the last decade. This year, the sorghum grain yield is forecasted at 50.0 bu/acre, which is tied for the fourth 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 2022, 700,000 tons of sorghum silage was produced, which is the highest sorghum silage production in a decade. The average yield was 14.0 tons/acre from 50,000 harvested acres. (USDA, National Agricultural Statistics Service, Mountain Region, Colorado Field Office, 2023).

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 Sally Jones-Diamond, phone (970) 214-4611, email Sally.Jones@colostate.edu; or Kevin Larson, phone (719) 324-5643, email Zane.Jenkins@colostate.edu or visit our website https://csucrops.com/sorghum for entry forms and further details. Names and addresses of sorghum seed companies submitting entries in 2023 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 (NOAA and CoAgMet, 2023), 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 such as: site description, irrigation, pest control, field history, and pertinent comments.

Entrants in the 2023 Colorado Sorghum Performance Trials.

Brand	Entered by
ALTA SEEDS	Advanta US, 2001 E. 1st St., P.O. Box 2420 Hereford, TX 79045
CHANNEL SEED, DEKALB	Bayer Crop Science, 800 N. Lindbergh Blvd., Creve Coeur, MO 63141
DYNA-GRO SEED	Loveland Products, Inc., 3005 Rocky Mountain Ave, Loveland, CO 80538
GOLDEN ACRES, KWS	AgReliant Genetics, 1122 East 169th St., Westfield, IN 46074
PIONEER, HOEGEMEYER HYBRIDS	Corteva Agriscience, P.O. Box 1000, Johnston, IA 50131
SORGHUM PARTNERS	S&W Seed, 2101 Ken Pratt Blvd, Suite 201 Longmont, CO 80501-6085
STAR SEED	Star Seed Inc., 101 Industrial Ave., Osborne, KS 67473

Growing Degree Days for sorghum were calculated from planting through 50% bloom date 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:

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

Experimental Methods and Evaluations

Trials at Walsh were planted with a four-row cone planter and harvested with a modified Gleaner F3 combine equipped with a HarvestMaster H2 weighing system and 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 Seed Research Equipment Solutions precision planter and harvested with a four-row Case 1620 combine modified as a multiple crop plot combine equipped with a HarvestMaster H2 weighing system. Forage sorghum was chopped using a two-row, self-propelled, New Holland 1880 silage chopper at Walsh, and a two-row, pull-type, New Holland 880 at Rocky Ford. Both silage choppers were equipped with electronic automated weighing systems.

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 halfway down the panicle. 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.

Emerged Plant Population. Emerged plant population in plants per acre was measured after seedling emergence and final stand establishment. Only main plants, and not tillers, were counted from two rows of the harvest plot length.

Harvest Population. Harvest population was the total number of grain-producing main heads and tillers at harvest from two rows of the harvest plot length in heads per acre.

Tillering. The ratio of harvest population (mature, harvestable heads) divided by the emerged plant population and subtracting one from the ratio for the main plant culm.

Test Weight. Test weight was recorded by Harvest Master measuring systems at all sites. A low test weight may indicate that a hybrid did not fully mature prior to the first freeze or that it suffered environmental stress, such as a water deficiency. Given moderate test weights, a low test weight may indicate a genetic difference.

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.

Brix. The sugar content, expressed as a percent, in the stalk of forage sorghums at harvest was measured with a hand refractometer.

Available Soil Water

Available soil water from wilting point to field capacity 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 varied with the amount of soil water present. With readings below 50% of available water, plant stress was possible. 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 5% and 20%, or 30%. Analysis of variance and regression were performed with CoStat Statistical Software, a product of Cohort Software, Berkeley, California, and with SAS 9.4, 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, Grand Valley Research Station at Fruita, and Plainsman Research Center at Walsh for their assistance in conducting these trials. We would like to extend a special thank you to our grower-cooperators for their assistance with the trials: Tim Stahlecker (Seibert), Burl Scherler (Sheridan Lake), and Cooksey Family Farms (Wiggins).

References

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2023 Dryland Grain Sorghum Hybrid Performance Trial at Akron

Brand	Hybrid	Grain Yield[a]	Yield	2-Year Avg. Yield	Test Weight	Moisture	Emerged Plant Population	Harvest Population[b]	Tillering[c]	50% Bloom	Plant Height	Maturity Group[d]	Grain Color
		bu/ac	% of test avg.	bu/ac	lb/bu	percent	plants/ac	heads/ac	tillers/plant	days after planting	inches		
Dekalb	DKS28-07	**117.2**	124%	76	55	13	32,461	78,009	1.8	77	43	E	Bronze
Channel	5R45	**114.2**	121%	71	56	14	37,158	63,446	0.7	82	46	ME	Red
Dekalb	DKS28-05	**108.6**	115%	72	55	13	33,181	86,531	1.5	78	44	E	Bronze
Channel	5B29	106.7	113%	-	56	14	35,744	83,472	1.4	76	41	ME	Bronze
Sorghum Partners	SP 31A15	104.7	111%	64	54	12	33,593	60,568	0.7	80	46	ME	Bronze
Dyna-Gro Seed	GX22923	104.1	111%	68	55	13	32,578	75,241	1.4	83	51	E	Cream
Dekalb	DKS29-28	102.8	109%	65	56	14	32,147	78,741	1.4	81	42	E	Bronze
Sorghum Partners	SP 45A45 DT	98.7	105%	60	56	12	25,482	69,400	2.0	82	44	ME	Bronze
Channel	5B70	95.8	102%	-	55	13	30,335	58,096	1.0	83	48	ME	Bronze
Dekalb	DKS29-95	95.2	101%	60	54	12	33,047	84,261	1.6	81	42	E	Dark Red
Pioneer	89Y79	95.0	101%	-	57	14	28,505	73,676	1.6	78	48	E	White
Dyna-Gro Seed	M54GR24	94.3	100%	61	57	13	30,390	75,561	1.6	77	45	E	Red
Pioneer	88P71	89.9	96%	-	56	13	28,308	68,808	1.4	82	45	E	Red
Pioneer	86P20	89.8	95%	-	55	13	32,972	66,034	1.1	83	43	ME	Red
Dyna-Gro Seed	M59GB94	87.8	93%	58	56	13	31,309	69,549	1.4	81	49	E	Bronze
Sorghum Partners	SP 43M80	84.5	90%	55	54	14	28,239	63,023	1.2	83	48	ME	Bronze
Dyna-Gro Seed	M59GB57	80.9	86%	55	55	13	30,568	74,485	1.2	80	39	E	Bronze
Sorghum Partners	SP 30A30 DT	79.5	84%	52	54	13	19,623	52,697	2.1	86	44	ME	Bronze
Dyna-Gro Seed	M60GB31	38.9	41%	28	39	10	28,925	53,108	0.9	-	56	M	Bronze
	Average	**94.1**		**60**	**55**	**13**	**30,800**	**70,200**	**1.4**	**81**	**45**		
	Replicates	4		8	4	4	4	2	2	4	1		
	[e]LSD (.30)	9											
	[e]LSD (.05)	18											
	Coefficient of Variation (CV)	14.5											

[a]Yields adjusted to 14% moisture and hybrids ranked by yield. Hybrid yields in bold are in the top LSD group (.30).

[b]Harvest population is the total number of grain-producing heads/panicles counted at harvest that were mature, including tillers.

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

[d]Maturity group: E=early; ME=medium-early; M=medium. Maturity groups are provided by the company and may not align with the observed flowering dates in the trial due to the latitude and relatively high elevation of the trial site (4,659 feet).

[e]If the difference between varieties is equal to or greater than the LSD value, the chance the difference is significant is 70% (for LSD 0.30) or 95% (for LSD 0.05). Farmers selecting a hybrid based on yield should use the LSD (.30) to protect themselves from false negative conclusions (concluding hybrids are the same when they are actually different). Companies or researchers may use LSD (.05) to avoid false positive conclusions (concluding hybrids are different when they are actually the same).

Site Information

Collaborator:	USDA-ARS Central Great Plains Research Center
Planting Date:	June 1, 2023
Harvest Date:	October 17, 2023
Fertilizer:	Pre-emerge: N at 50 lb/ac
Herbicide:	Pre-emerge: Buccaneer at 1.5 qt/ac, Sterling Blue at 4 oz/ac, and Sharpen at 2 oz/ac
Previous Crop:	Winter wheat
Soil Type:	Weld silt loam
GPS Coordinates:	40.15427. -103.14370
Trial Comments:	Planted June 1st into excellent moisture. Average stands and emergence. Most hybrids were flowering by week of Aug. 22nd. Very timely and frequent rainfall allowed for excellent yield. Good weed control throughout the season. No lodging noted at harvest. Radar estimates showed the trial received 12.8 inches of rain from planting to harvest, and 22 inches since January 1st, which is 138% of the ten-year average (year-to-date).

2023 Dryland Grain Sorghum Hybrid Performance Trial at Seibert

Brand	Hybrid	Grain Yield[a]	Yield	2-Year Avg. Yield	Test Weight	Moisture	Emerged Plant Population	Harvest Population[b]	Tillering[c]	50% Bloom	Plant Height	Lodging	Maturity Group[d]	Grain Color
		bu/ac	% of test avg.	bu/ac	lb/bu	percent	plants/ac	heads/ac	tillers/plant	days after planting	inches	percent		
Dyna-Gro Seed	GX22923	**70.3**	126%	55	60	16	37,015	52,879	0.3	76	45	30	E	Cream
Channel Seed	5B70	**69.9**	125%	-	58	18	33,069	42,764	0.3	78	42	13	ME	Bronze
Channel Seed	5B29	65.1	116%	-	59	17	39,122	44,365	0.1	68	42	9	E	Bronze
Golden Acres	GA 2630C	61.1	109%	-	59	15	39,041	38,655	0.0	78	40	8	E	Cream
Dekalb	DKS28-05	59.9	107%	48	59	14	38,811	55,583	0.4	67	47	38	E	Bronze
Sorghum Partners	SP 43M80	58.8	105%	50	59	17	34,615	37,067	0.0	77	50	11	ME	Bronze
Pioneer	88P71	58.0	104%	-	60	17	37,605	51,766	0.4	75	50	20	E	Red
Golden Acres	GA 2730B	57.9	104%	51	60	17	32,074	46,819	0.6	74	52	75	ME	Bronze
Dyna-Gro Seed	M54GR24	57.7	103%	49	59	15	36,661	52,207	0.4	68	45	53	E	Red
Dyna-Gro Seed	M59GB57	56.7	101%	49	58	14	33,664	39,020	0.1	73	42	18	E	Bronze
Sorghum Partners	SP 45A45 DT	55.8	100%	47	58	16	38,701	38,362	0.0	79	36	5	ME	Bronze
Dekalb	DKS28-07	55.1	99%	47	59	15	34,630	41,290	0.2	70	42	20	E	Bronze
Dekalb	DKS29-28	54.7	98%	47	59	16	33,995	46,275	0.3	76	40	20	E	Bronze
Sorghum Partners	SP 30A30 DT	53.5	96%	44	59	15	37,247	39,959	0.1	77	38	8	ME	Bronze
Dekalb	DKS29-95	53.4	96%	50	58	16	38,661	48,555	0.3	76	41	8	E	Dark Red
Hoegemeyer Seed	H6041	53.4	96%	51	61	16	34,163	47,077	0.3	75	45	60	ME	Cream
Dyna-Gro Seed	M60GB31	52.4	94%	46	59	19	31,902	35,103	0.3	84	44	18	ME	Bronze
Pioneer	86P20	52.0	93%	-	59	16	33,679	51,413	0.5	74	41	30	ME	Red
Sorghum Partners	SP 31A15	51.3	92%	45	57	15	36,535	39,901	0.1	77	40	20	ME	Bronze
Dyna-Gro Seed	M59GB94	50.4	90%	44	58	18	36,531	38,690	0.1	78	44	28	E	Bronze
Hoegemeyer Seed	H6006	50.2	90%	-	60	20	36,156	47,733	0.3	75	45	31	ME	Red
Pioneer	89Y79	49.4	88%	-	60	16	37,785	43,299	0.2	71	44	13	E	White
Hoegemeyer Seed	H6020	48.7	87%	46	59	16	35,884	40,742	0.1	76	44	23	ME	Red
Golden Acres	GA 1510C	45.8	82%	45	60	13	34,106	51,051	0.4	72	36	15	E	Cream
	Average	**55.9**		**48**	**59**	**16**	**35,900**	**44,600**	**0.2**	**75**	**43**	**24**		
	Replicates	4	-	8	4	4	4	2	2	4	1	4		
	[e]LSD (.30)	5.1												
	[e]LSD (.05)	9.7												
	Coefficient of Variation (CV)	11.9												

[a]Yields adjusted to 14% moisture and hybrids ranked by yield. Hybrid yields in bold are in the top LSD group (.30).

[b]Harvest population is the total number of grain-producing heads/panicles counted at harvest that were mature, including tillers.

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

[d]Maturity group: E=early; ME=medium-early. Maturity groups are provided by the company and may not align with the observed flowering dates in the trial due to the latitude and relatively high elevation of the trial site (4,700 feet).

[e]If the difference between varieties is equal to or greater than the LSD value, the chance the difference is significant is 70% (for LSD 0.30) or 95% (for LSD 0.05). Farmers selecting a hybrid based on yield should use the LSD (.30) to protect themselves from false negative conclusions (concluding hybrids are the same when they are actually different). Companies or researchers may use LSD (.05) to avoid false positive conclusions (concluding hybrids are different when they are actually the same).

Site Information

Collaborator:	Tim Stahlecker
Planting Date:	May 28, 2023
Harvest Date:	October 16, 2023
Herbicide:	Pre-plant: Atrazine 4L at 1 pt/ac, Dicamba HD at 3 oz/ac, and Callisto at 2 oz/ac
Soil Type:	Ascalon sandy loam
GPS Coordinates:	39.26016, -102.81586
Trial Comments:	Planted 1.5" deep into moisture. Excellent stands and emergence and good weed control throughout the season. Trial average flowering date of August 11th. Radar estimates showed the trial received about 16 inches of rain from planting to harvest, and 24.3 inches since January 1st, which is 125% of the ten-year average (year-to-date).

2023 Dryland Grain Sorghum Hybrid Performance Trial at Sheridan Lake

Brand	Hybrid	Grain Yield[a]	Yield	2-Year Avg. Yield	Test Weight	Moisture	Emerged Plant Population	Harvest Population[b]	Tillering[c]	50% Bloom	Plant Height	Lodging	Maturity Group[d]	Grain Color
		bu/ac	% of test avg.	bu/ac	lb/bu	percent	plants/ac	heads/ac	tillers/plant	days after planting	inches	percent		
Channel Seed	5B70	**127.9**	116%	-	61	14	29,486	52,584	0.7	74	45	20	ME	Bronze
Hoegemeyer Seed	H6037	**124.4**	113%	88	62	13	37,311	55,650	0.5	68	45	33	ME	Red
Dyna-Gro Seed	GX22923	**123.8**	112%	91	62	13	31,828	59,431	0.9	70	43	33	E	Cream
Sorghum Partners	SP 45A45 DT	**122.4**	111%	83	61	13	35,490	56,751	0.5	74	45	5	ME	Bronze
Dekalb	DKS38-16	**122.3**	111%	88	64	15	33,898	51,758	0.5	73	49	18	ME	Bronze
Dekalb	DKS36-07	**121.3**	110%	87	62	14	34,913	62,030	0.8	72	45	33	ME	Bronze
Sorghum Partners	SP 31A15	116.7	106%	84	62	14	34,687	53,946	0.4	72	42	3	ME	Bronze
Dyna-Gro Seed	M59GB94	116.3	105%	85	63	13	31,594	68,034	1.1	70	47	0	E	Bronze
Dyna-Gro Seed	M63GB78	116.3	105%	84	63	12	29,443	48,420	0.7	75	46	30	ME	Bronze
Alta Seed	ADV G2106	115.9	105%	-	64	13	33,892	45,253	0.3	72	42	5	M	Red
Golden Acres	GA 2630C	115.9	105%	-	63	15	33,471	61,123	0.8	70	42	28	E	Cream
Dyna-Gro Seed	M60GB88	115.1	104%	85	63	14	28,628	52,415	0.9	75	47	18	ME	Bronze
Sorghum Partners	SP 30A30 DT	113.1	102%	81	63	13	34,406	61,611	0.7	72	47	25	ME	Bronze
Dyna-Gro Seed	M59GB57	111.5	101%	77	62	13	31,454	56,496	1.0	66	41	3	E	Bronze
Hoegemeyer Seed	H6020	111.4	101%	80	63	14	30,851	55,566	0.7	68	43	30	ME	Red
Pioneer	86P20	111.1	101%	-	62	13	36,382	49,283	0.3	70	42	10	ME	Red
Sorghum Partners	SPSD353	111.0	101%	-	61	15	23,734	47,821	0.8	82	43	0	M	Bronze
Sorghum Partners	SP 65M60	110.7	100%	-	59	13	34,746	40,572	0.2	88	47	0	M	Bronze
Dyna-Gro Seed	M60GB31	109.6	99%	79	62	16	29,599	49,707	0.6	79	50	0	ME	Bronze
Alta Seed	ADV G2168IG	109.6	99%	-	63	13	29,573	53,474	0.7	73	42	5	M	Red
Dekalb	DKS29-95	108.3	98%	84	62	14	34,998	58,449	0.7	71	45	0	E	Dark Red
Hoegemeyer Seed	H6006	106.7	97%	-	64	16	35,416	58,558	0.6	69	41	18	ME	Red
Dyna-Gro Seed	M54GR24	103.8	94%	76	61	15	31,273	60,753	0.9	64	43	0	E	Red
Sorghum Partners	SP 66M16	103.2	94%	-	62	18	24,437	54,822	1.1	79	44	0	M	Bronze
Golden Acres	GA 2730B	103.0	93%	73	63	14	30,224	49,586	0.6	70	46	13	ME	Bronze
Sorghum Partners	SP 43M80	102.9	93%	77	63	18	32,472	42,636	0.3	71	47	0	ME	Bronze
Dekalb	DKS28-07	102.8	93%	75	62	13	37,028	60,831	0.6	65	46	10	E	Bronze
Dekalb	DKS29-28	102.2	93%	74	63	13	32,400	53,337	0.8	67	36	0	E	Bronze
Dekalb	DKS28-05	99.4	90%	74	62	13	36,812	61,423	0.7	64	44	8	E	Bronze
Alta Seed	ADV G2193IG	98.4	89%	-	63	14	31,697	51,022	0.6	73	42	8	M	Red
Golden Acres	GA 1510C	98.2	89%	68	62	15	31,467	51,040	0.6	71	42	0	E	Cream
Alta Seed	ADV G1329	94.4	85%	-	62	13	30,470	45,842	0.6	73	36	3	E	Cream
Pioneer	89Y79	93.4	85%	-	61	14	33,709	53,020	0.5	65	43	3	E	White
	Average	**110.4**		**81**	**62**	**14**	**32,400**	**54,000**	**0.7**	**72**	**44**	**11**		
	[e]LSD (.30)	6.8												
	[e]LSD (.05)	12.9												
	Coefficient of Variation (CV)	9.9												

[a]Yields adjusted to 14% moisture and hybrids ranked by yield. Hybrid yields in bold are in the top LSD group (.30).

[b]Harvest population is the total number of grain-producing heads/panicles counted at harvest that were mature, including tillers.

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

[d]Maturity group: E=early; ME=medium-early; M=medium. Maturity groups are provided by the company and may not align with the observed flowering dates in the trial due to the latitude and relatively high elevation of the trial site (3,990 feet).

[e]If the difference between varieties is equal to or greater than the LSD value, the chance the difference is significant is 70% (for LSD 0.30) or 95% (for LSD 0.05). Farmers selecting a hybrid based on yield should use the LSD (.30) to protect themselves from false negative conclusions (concluding hybrids are the same when they are actually different). Companies or researchers may use LSD (.05) to avoid false positive conclusions (concluding hybrids are different when they are actually the same).

Site Information

Collaborator:	Scherler Farms
Planting Date:	May 31, 2023
Harvest Date:	October 17, 2023
Fertilizer:	Pre-plant: N at 50 lb/ac
Herbicide:	2,4-D LV4 at 0.33 pt/ac applied on June 29
Soil Type:	Olney sandy loam
GPS Coordinates:	38.524830,-102.473385
Trial Comments:	Planted 1.5" deep into moisture. Very good stands and emergence and excellent weed control throughout the season. Trial average flowering date of August 10th. Radar estimates showed the trial received about 10.2 inches of rain from planting to harvest, and 17.9 inches since January 1st, which is 121% of the ten-year average (year-to-date).

2023 Dryland Grain Sorghum Hybrid Performance Trial at Walsh

Brand	Hybrid	Grain Yield[a]	Yield	2-Year Avg. Yield	Test Weight	Plant Lodging	Emerged Plant Population	Plant Height	50% Bloom	GDD[b]	50% Mature	Maturity Group[c]	Grain Color
		bu/ac	% of test avg.	bu/ac	lb/bu	percent	plants/ac	in	days after planting		days after planting		
Dekalb	DKS29-28	**51.6**	124	63	58	10	31,400	40	63	1491	107	E	Bronze
Dekalb	DKS38-16	**49.9**	120	67	60	15	32,500	46	72	1728	117	M/ME	Bronze
Sorghum Partners	SP 30A30 DT	**48.2**	116	--	58	15	37,200	41	65	1542	109	E	Bronze
Alta Seeds	ADV G2106	**46.0**	111	--	60	12	36,000	44	66	1563	110	ME/M	Red
Dekalb	DKS29-95	**45.2**	109	62	58	5	34,500	41	64	1517	107	E	Dark Red
Sorghum Partners	SP 31A15	**45.0**	108	--	58	7	38,300	41	65	1542	109	E	Bronze
Sorghum Partners	SP 65M60	**44.8**	108	--	60	4	32,500	39	69	1637	114	ME/M	Bronze
Sorghum Partners	SP 45A45 DT	**44.7**	107	--	58	6	35,200	43	71	1701	115	M/ME	Bronze
Dekalb	DKS36-07	**43.8**	105	69	58	8	35,200	48	71	1701	116	M/ME	Bronze
DynaGro	M60GB31	**43.8**	105	61	59	10	31,000	44	70	1669	114	ME	Bronze
Sorghum Partners	SPSD353	43.1	104	55	61	0	29,000	42	73	1748	118	M	Bronze
Sorghum Partners	SP 66M16	43.1	104	--	60	1	36,800	39	69	1637	113	ME/M	Bronze
DynaGro	M59GB94	41.7	100	61	60	4	38,700	42	66	1563	110	ME	Bronze
DynaGro	GX22923	40.7	98	64	58	31	38,700	46	66	1563	110	ME	Cream
DynaGro	M59GB57	40.2	97	54	59	20	31,400	40	65	1542	109	E	Bronze
Dekalb	DKS28-05	39.8	96	--	59	36	36,800	49	62	1464	106	E	Bronze
Alta Seeds	ADV G2193IG	39.6	95	--	59	5	35,200	40	67	1588	110	ME/M	Red
Sorghum Partners	SP 43M80	38.0	91	59	59	8	35,600	45	68	1614	114	ME	Bronze
DynaGro	M63GB78	37.9	91	63	59	15	32,100	44	71	1701	115	M	Bronze
Dekalb	DKS28-07	37.9	91	59	59	26	37,200	42	63	1491	107	E	Bronze
Alta Seeds	ADV G2168IG	37.4	90	--	59	7	31,800	43	71	1701	115	M	Red
DynaGro	M60GB88	37.2	89	58	57	34	33,300	45	65	1542	107	E	Bronze
DynaGro	M54GR24	34.5	83	57	59	39	40,300	43	61	1434	104	E	Red
Alta Seeds	ADV G1329	23.1	56	--	59	6	31,800	29	65	1542	109	E	Cream
Average		**41.6**		**61**	**59**	**14**	**34,700**	**42**	**67**	**1593**	**111**	**ME**	
[d]LSD (P<0.20)		8.2				22							
[d]LSD (P<0.05)		12.5				14							

[a]Yields adjusted to 14% moisture and hybrids ranked by yield. Yields in bold are in the top LSD (.20) group and are not significantly different from one another.

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

[c]Maturity Group: E=early; ME=medium-early; M=medium; ML=medium late; L=late. Maturity groupings with two classes are trial observation/seed company description.

[d]Farmers selecting a hybrid based on yield should use the LSD (.20) to protect themselves from false negative conclusions (concluding hybrids are the same when they are actually different). Companies or researchers may be interested in the LSD (.05) to avoid false positive conclusions (concluding hybrids are different when they are actually the same). Yield differences less than the LSD value are considered the same.

Site Information

Collaborator: Plainsman Research Center (Kevin Larson, Brett Pettinger, Perry Jones, and Zane Jenkins)

Planting Date: June 2, 2023 at 43,500 seeds/ac, planting depth 1.5 in.

Harvest Date: November 2, 2023 with a harvest area of 10 ft. by 44 ft. per plot.

Previous Crop: Wheat

Herbicide: Preemergence: Flumioxazin at 3.0 oz/ac, Atrazine at 1.0 lb ai/ac, Mesotrione at 6.4 oz/ac, and Outlook at 16 oz/ac; Post emergence: Huskie at 15 oz/ac, Atrazine at 0.5 lb ai/ac, and AMS at 1.0 lb/ac.

Fertilizer: Anhydrous N at 60 lb/ac and 10-34-0 at 5 gal/ac (20 lb P_2O_5/ac, 6 lb N/ac) was strip till applied.

Soil Type: Richfield silt loam

Comments: Planted into strip tilled wheat stubble. Rapid emergence and good stands. Total rainfall for the growing season was well above average with 19.13 in. June (5.18 in.) and July (6.39 in.) were wet. August was dry with 1.90 in. September was hot with three days over 100F. Weed control was good. Three hybrids had more than 30% lodging at harvest.

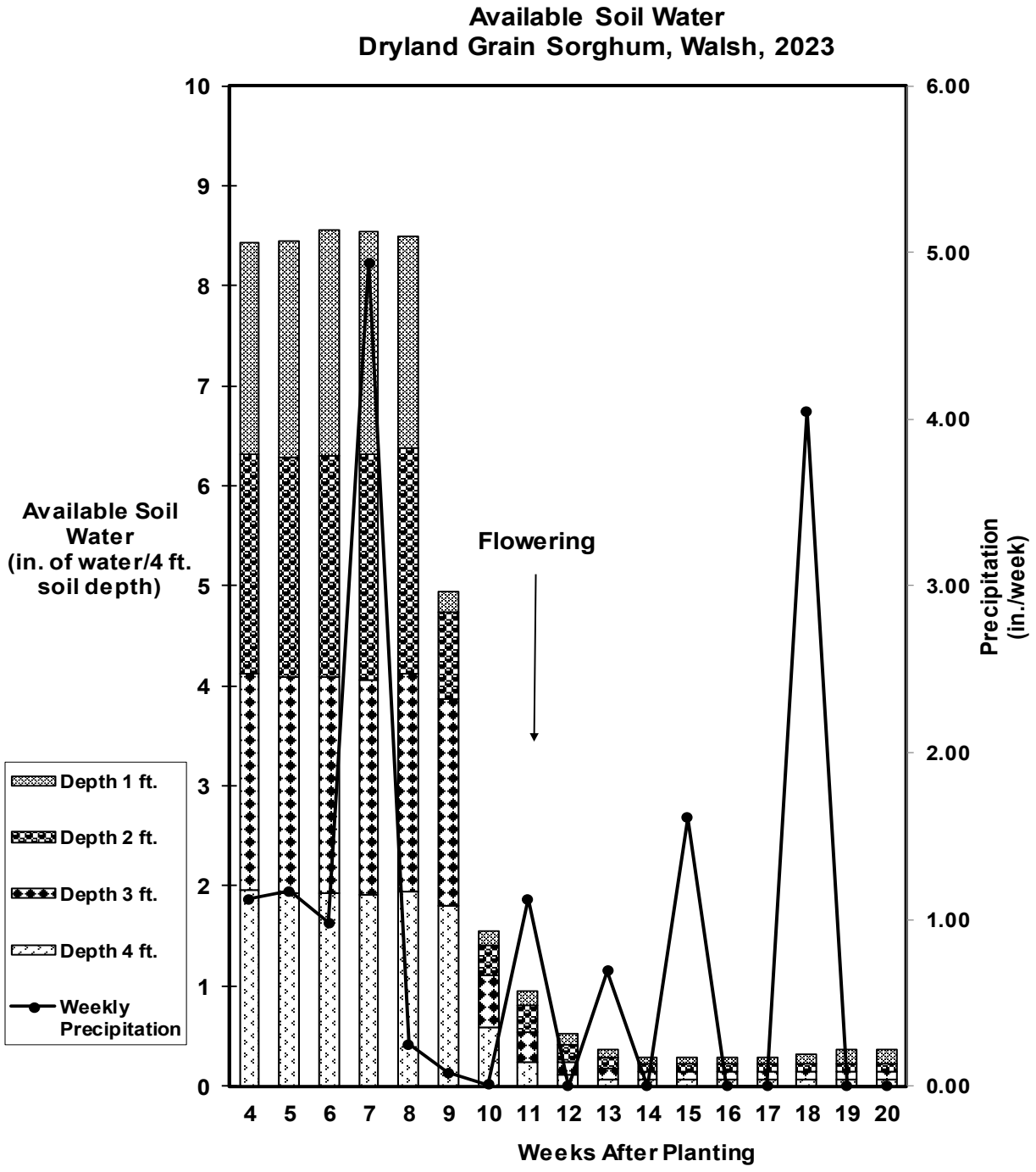


Fig. 1. Available soil water in dryland grain sorghum at Walsh. Gypsum block measurements taken to 4 ft. with 1 ft. increments. Total rainfall at Walsh from planting (June 2) to first freeze (October 15) was 19.13 in. Any increase in available soil water between weeks is from rain.

2023 Irrigated Grain Sorghum
Hybrid Performance Trial at Rocky Ford

Brand	Hybrid	Grain Yield[a]	Yield	2-Year Avg. Yield	Test Weight	Moisture	Maturity Group[b]	Grain Color
		bu/ac	% of test avg.	bu/ac	lb/bu	percent		
Dekalb	DKS36-07	**125.5**	135%	127	59	19	ME	Bronze
Dyna-Gro Seed	GX22923	116.5	125%	116	59	17	E	Cream
Dyna-Gro Seed	M59GB94	115.5	124%	117	59	16	E	Bronze
Dyna-Gro Seed	M60GB31	111.5	120%	118	60	20	ME	Bronze
Channel Seed	5B70	106.0	114%	-	60	19	E	Bronze
Dyna-Gro Seed	M63GB78	104.5	112%	117	59	17	ME	Bronze
Dekalb	DKS38-16	103.5	111%	119	63	16	ME	Bronze
Dekalb	DKS29-28	95.0	102%	106	59	14	E	Bronze
Dekalb	DKS29-95	92.5	99%	108	60	14	E	Dark Red
Dyna-Gro Seed	M59GB57	86.0	92%	95	59	15	E	Bronze
Dekalb	DKS28-07	85.0	91%	104	60	14	E	Bronze
Alta Seed	ADV G2106	84.0	90%	-	60	16	M	Red
Dyna-Gro Seed	M60GB88	82.5	89%	99	61	14	ME	Bronze
Alta Seed	ADV G2168IG	82.5	89%	-	61	20	M	Red
Alta Seed	ADV G2193IG	78.0	84%	-	59	19	M	Red
Dyna-Gro Seed	M54GR24	71.0	76%	87	61	15	E	Red
Dekalb	DKS28-05	67.0	72%	95	60	15	E	Bronze
Alta Seed	ADV G1329	64.5	69%	85	61	14	E	Cream
	Average	**93.0**	**100%**	**107**	**60**	**16**		
	[c]LSD (.30)	8						
	[c]LSD (.05)	16						
	Coefficient of Variation (CV)	12.2						

[a]Yields adjusted to 14% moisture and hybrids ranked by yield. Hybrid yields in bold are in the top LSD group (.30).

[b]Maturity group: E=early; ME=medium-early; M=medium. Maturity groups are provided by the company and may not align with the observed flowering dates in the trial due to the latitude and relatively high elevation of the trial site (4,180 feet).

[c]Farmers selecting a hybrid based on yield should use the LSD (.30) to protect themselves from false negative conclusions (concluding hybrids are the same when they are actually different). Companies or researchers may be interested in the LSD (.05) to avoid false positive conclusions (concluding hybrids are different when they are actually the same).

Site Information

Collaborator:	CSU Arkansas Valley Research Station (Kevin Tanabe)
Planting Date:	May 24, 2023
Harvest Date:	October 10, 2023
Herbicides:	Huskie at 16 oz/ac and Starane Ultra at 6 oz/ac applied on June 21
Soil Type:	Rocky Ford silty clay loam
GPS Coordinates:	38.0382, -103.69406
Trial Comments:	Trial had good emergence and average stands. Moderate pressure from kochia in the field. Weather station on-site showed the trial received about 7 inches of rain from planting to harvest (in addition one irrigation on August 1) and 11.7 inches since January 1st, which is 102% of the ten-year average (year-to-date).

2023 Sprinkler Irrigated Grain Sorghum Hybrid Performance Trial at Walsh

Brand	Hybrid	Grain Yield[a]	Yield	2-Year Avg. Yield	Test Weight	Emerged Plant Population[b]	Plant Height	50% Bloom	GDD[c]	50% Mature	Maturity Group[d]	Grain Color
		bu/ac	% of test avg.	bu/ac	lb/bu	plants/ac	in	days after planting		days after planting[e]		
Dyna-Gro Seed	M60GB31	**112.4**	111	112	63.8	39,500	58	73	1785	119	M/ME	Bronze
Sorghum Partners	SP 65M60	**112.0**	111	--	60.6	40,900	55	75	1823	122	M	Bronze
Sorghum Partners	SPSD353	**111.9**	111	109	62.0	34,100	58	74	1805	121	M	Bronze
Dyna-Gro Seed	M59GB94	**111.4**	110	103	62.4	35,100	59	69	1671	115	ME	Bronze
Dyna-Gro Seed	M63GB78	**107.7**	106	106	61.2	37,100	53	73	1785	120	M	Bronze
Sorghum Partners	SP 43M80	100.5	99	91	63.2	44,100	56	69	1671	115	ME	Bronze
Sorghum Partners	SP 66M16	100.5	99	--	63.1	38,500	55	72	1758	118	M	Bronze
Sorghum Partners	SP 65B21 DT	99.0	98	--	61.4	35,500	45	71	1726	118	M	Bronze
Sorghum Partners	SP 58M85 DT	97.9	97	--	62.8	36,500	53	69	1671	115	M	Bronze
Sorghum Partners	SP 45A45 DT	97.3	96	--	62.2	43,100	53	69	1671	114	ME	Bronze
Dyna-Gro Seed	M60GB88	96.9	96	98	60.8	43,500	56	68	1645	111	E	Bronze
Sorghum Partners	SP 30A30 DT	92.9	92	--	62.5	41,900	54	68	1645	112	E	Bronze
Dyna-Gro Seed	M59GB57	89.0	88	89	61.3	38,900	45	63	1521	107	E	Bronze
Dyna-Gro Seed	M54GR24	87.0	86	89	61.1	44,500	51	62	1491	106	E	Red
Average		**101.2**		**100**	**62.0**	**39,500**	**54**	**70**	**1691**	**115**	**M**	
[f]LSD (P<0.20)		5.3										
[f]LSD (P<0.05)		8.5										

[a]Yields adjusted to 14% moisture and hybrids ranked by yield. Yields in bold are in the top LSD (.20) group and are not significantly different from one another.

[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. Maturity groupings with two classes are trial observation/seed company description.

[e]Days after planting or seed maturation.

[d]Farmers selecting a hybrid based on yield should use the LSD (.20) to protect themselves from false negative conclusions (concluding hybrids are the same when they are actually different). Companies or researchers may be interested in the LSD (.05) to avoid false positive conclusions (concluding hybrids are different when they are actually the same). Yield differences less than the LSD value are considered the same.

Site Information

Collaborator:	Plainsman Research Center (Kevin Larson, Brett Pettinger, Perry Jones, and Zane Jenkins)
Planting Date:	May 31, 2023 at 50,000 seeds/ac.
Harvest Date:	October 27, 2023, harvest area was 10 ft. by 800 ft. (average).
Previous Crop:	Corn
Herbicide:	Preemergence: Flumioxazin at 3.0 oz/ac; Atrazine at 1.0 lb ai/ac, Mesotrione at 6.4 oz/ac; and Outlook at 16 oz/ac; Post emergence: Huskie at 15 oz/ac, Atrazine 0.5 lb ai/ac, AMS at 1 lb/ac.
Fertilizer:	Anhydrous N at 150 lb/ac and 10-34-0 at 7.5 gal/ac was strip till applied and 10-34-0 at 5 gal/ac at planting.
Irrigation:	Sprinkler irrigated with 10.0 in./ac of total applied irrigation.
Soil Type:	Wiley loam
Comments:	Planted into strip tilled corn stalks. Rapid emergence and good stands. Total rainfall for the growing season was well above average with 19.13 in. June (5.18 in.) and July (6.39 in.) were wet. August was dry with 1.90 in. September was hot with three days over 100F. Weed control was only fair due to considerable volunteer corn. Little or no lodging noted at harvest. Total sprinkler applied irrigation was 10 in/ac.

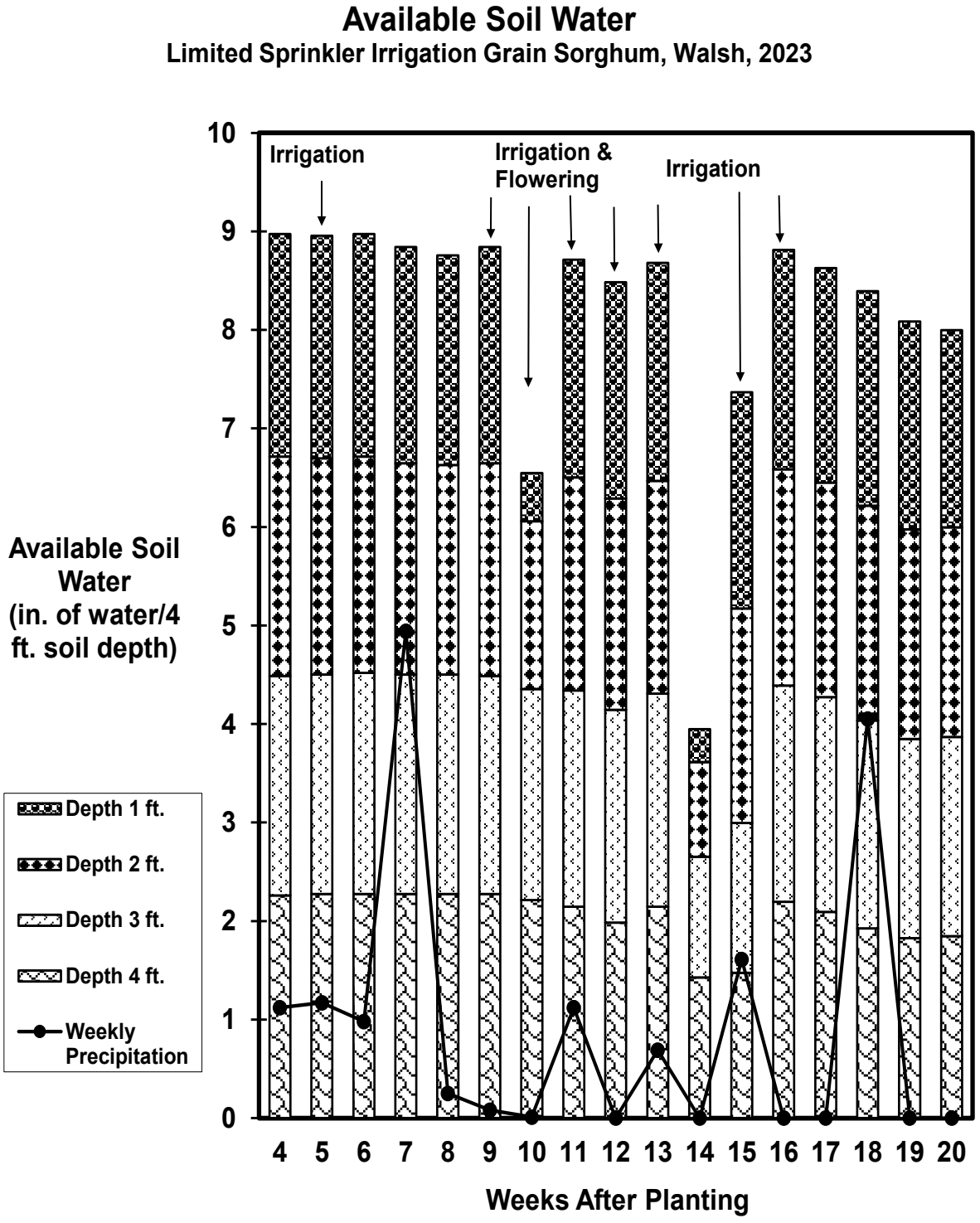


Fig. 2. Available soil water in irrigated grain sorghum at Walsh. Gypsum block measurements taken to 4 ft. with 1 ft. increments. Total rainfall at Walsh from planting (May 31) to first freeze (October 15) was 19.13 in. Any increase in available soil water between weeks not attributed to applied irrigation is from rain.

2023 Irrigated Grain Sorghum Hybrid Performance Trial at Wiggins

Brand	Hybrid	Grain Yield[a]	Yield	Test Weight	Moisture	Plant Population	Plant Height	Maturity Group[b]	Grain Color
		bu/ac	% of test avg.	lb/bu	percent	plants/ac	in		
Pioneer	86P20	**142.2**	117%	57	12	51,346	47	ME	Red
Channel Seed	5R45	**138.2**	114%	57	12	54,448	47	ME	Red
Dyna-Gro Seed	GX22923	**134.3**	111%	54	10	52,393	50	E	Cream
Channel Seed	5B70	**133.7**	110%	56	12	50,259	54	E	Bronze
Sorghum Partners	SP 65M60	**132.3**	109%	55	11	54,049	47	ME	Bronze
Sorghum Partners	SP 45A45 DT	**130.8**	108%	55	11	50,675	50	ME	Bronze
Sorghum Partners	SP 43M80	127.4	105%	57	13	48,416	52	ME	Bronze
Dyna-Gro Seed	M59GB94	127.2	105%	57	13	52,238	53	E	Bronze
Alta Seed	ADV G2193IG	126.9	104%	57	12	53,267	47	M	Red
Golden Acres	GA 2730B	126.7	104%	56	12	55,645	53	ME	Bronze
Pioneer	88P71	124.7	103%	57	12	45,298	53	E	Red
Alta Seed	ADV G2106	124.2	102%	57	12	47,491	50	M	Red
Dyna-Gro Seed	M60GB31	122.9	101%	58	12	51,129	48	ME	Bronze
Channel Seed	6B02	120.3	99%	57	12	48,934	53	ME	Bronze
Golden Acres	GA 2630C	120.2	99%	56	11	47,402	51	E	Cream
Dyna-Gro Seed	M59GB57	119.6	98%	56	11	51,388	43	E	Bronze
Sorghum Partners	SPSD353	117.6	97%	55	11	40,508	49	M	Bronze
Sorghum Partners	SP 66M16	111.0	91%	57	12	52,226	48	M	Bronze
Channel Seed	5B90	110.4	91%	57	12	51,243	52	ME	Bronze
Sorghum Partners	SP 30A30 DT	109.9	90%	56	11	48,576	52	ME	Bronze
Dyna-Gro Seed	M54GR24	108.5	89%	57	12	55,681	48	E	Red
Golden Acres	GA 1510C	105.6	87%	56	12	52,265	41	E	Cream
Alta Seed	ADV G2168IG	102.2	84%	57	13	45,522	44	M	Red
Alta Seed	ADV G1329	93.6	77%	56	11	43,606	41	E	Cream
	Average	**121.5**		**56**	**12**	**50,200**	**49**		
	Replicates	3		3	3	3	1		
	[c]LSD (.30)	14							
	[c]LSD (.05)	27							
	Coefficient of Variation (CV)	15.4							

[a]Yields adjusted to 14% moisture and hybrids ranked by yield. Hybrid yields in bold are in the top LSD group (.30).

[b]Maturity group: E=early; ME=medium-early; M=medium. Maturity groups are provided by the company and may not align with the observed flowering dates in the trial due to the latitude and relatively high elevation of the trial site (4,800 feet).

[c]Farmers selecting a hybrid based on yield should use the LSD (.30) to protect themselves from false negative conclusions (concluding hybrids are the same when they are actually different). Companies or researchers may be interested in the LSD (.05) to avoid false positive conclusions (concluding hybrids are different when they are actually the same).

Site Information

Collaborator:	Cooksey Family Farms
Planting Date:	June 2, 2023
Harvest Date:	November 9, 2023
Herbicides:	Warrant Ultra at 2 qt/ac and Atrazine DF at 1 lb/ac applied at planting
Soil Type:	Truckton sandy loam
GPS Coordinates:	39.9919943, -104.1025632
Trial Comments:	Trial had good emergence and stands. Field had moderate weed pressure mid-season, hand labor was used to clean up trial area. Radar estimates showed the trial received about 13 inches of rain from planting to harvest, and 23.5 inches since January 1st, which is 132% of the ten-year average (year-to-date).

2023 Dryland Hybrid Forage Sorghum Performance Trial at Walsh

Brand	Hybrid	Forage Yield[a]	Yield	2-Year Forage Avg.	Brix	Emerged Plant Population	Plant Height	Lodging	Days to Flowering	Relative Maturity [b]	Forage Type[c]	Traits[d]	RFQ[e]
		tons/ac	% of test avg.	tons/ac	%	plants/ac	in	%	days after planting				percent
Dyna-Gro Seed	Super Sile 30	**13.4**	144	15	11.2	51,900	79	1	95	M/ME	FS	-	120
Dyna-Gro Seed	F72FS05	11.0	118	12	9.6	49,200	55	0	96	M/ME	FS	-	135
Dyna-Gro Seed	Fullgraze II	10.7	115	13	16.8	55,400	104	0	103	ML	SS	-	110
Sorghum Partners	SS405	10.7	114	12	14.1	44,500	87	3	112	ML	FS	-	126
Dyna-Gro Seed	Super Sile 20	10.5	112	13	16.2	57,300	81	0	106	ML	FS	-	123
Sorghum Partners	SP2707 DT	10.5	112	--	14.5	41,400	44	0	87	M/ME	FS	DT	140
Sorghum Partners	SP2606 BMR	10.3	110	--	12.3	48,800	56	5	87	M/ME	FS	BMR	125
Dyna-Gro Seed	F74FS23 BMR	10.1	108	12	8.5	48,800	71	1	95	M	FS	BMR	161
Dyna-Gro Seed	Danny Boy II BMR	10.0	107	13	13.3	52,300	81	0	Veg	PPS	SS	PS BMR	135
Dyna-Gro Seed	F74FS72 BMR	9.5	102	10	15.3	54,600	49	0	107	ML/M	FS	BMR	136
Dyna-Gro Seed	Fullgraze II BMR	9.4	101	14	12.8	53,800	82	0	129	L/ML	SS	BMR	128
Dyna-Gro Seed	Sweet Ton MS	9.3	100	14	13.3	51,900	92	6	79	M/ML	FS	MS	137
Sorghum Partners	NK300	8.7	93	9	8.0	50,300	55	1	85	M/ME	FS	-	143
Dyna-Gro Seed	F72FS25 BMR	8.5	90	10	12.8	41,800	55	0	98	M	FS	BMR	141
Dyna-Gro Seed	F75FS13	8.3	89	11	8.2	46,500	84	32	74	ME/M	FS	-	147
Dyna-Gro Seed	F71FS72 BMR	8.2	88	11	12.1	49,200	67	13	73	ME/E	FS	BMR	204
Sorghum Partners	SP1727 MS BMR	8.1	87	11	8.6	51,100	75	3	81	M	FS	MS BMR	157
Dyna-Gro Seed	Dynagraze II BMR	7.8	83	11	16.5	51,500	86	0	80	M/ME	SS	BMR	141
Dyna-Gro Seed	Super Sweet 10	6.0	64	10	12.5	48,400	74	6	71	ME/M	SS	-	120
Dyna-Gro Seed	Dynagraze II	5.9	63	8	11.7	45,700	85	3	73	ME	SS	-	135
Average		**9.3**		**11.7**	**12.4**	**49,700**	**73**	**4**	**91**				**138**
[f]LSD (P<0.20)		1.01						3.1					
[f]LSD (P<0.05)		1.56						4.8					

[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. Maturity groups with two classes are trial observation/seed company description.

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

[d]Traits: BD=brachytic dwarf; BMR=brown mid-rib; DT=Double Team; SCA=Sugar Cane Aphid.

[e]Forage quality analyses based on oven-dried weight. RFQ=relative forage quality.

[f]Farmers selecting a hybrid based on yield should use the LSD (.20) to protect themselves from false negative conclusions (concluding hybrids are the same when they are actually different). Companies or researchers may be interested in the LSD (.05) to avoid false positive conclusions (concluding hybrids are different when they are actually the same). Yield differences less than the LSD value are considered the same.

Site Information

Collaborator: Plainsman Research Center (Kevin Larson, Brett Pettinger, Perry Jones, and Zane Jenkins)
Planting Date: 6/2/2023
Harvest Date: 10/17/2023
Previous Crop: Wheat
Herbicide: Preemergence: Flumioxazin at 3.0 oz/ac; Atrazine at 1.0 lb ai/ac; Mesotrione at 6.0 oz/a; Metolachlor at 1.33 pts/ac; Gylphosate at 32 oz/ac.
Post emergence: Huskie at 15 oz/ac; Atrazine at 0.5 lb ai/ac; NIS at 8 oz/ac; AMS at 1.0 lb/ac.
Fertilizer: Anhydrous N at 60 lb/ac and 10-34-0 at 5 gal/ac (20 lb P_2O_5/ac, 6 lb N/ac) was strip till applied.
Soil Type: Richfield silt loam
Comments: Planted into strip tilled wheat stubble. Rapid emergence and good stands. Precipitation for the growing season was well above average. June and July were wet (5.18 in. for June and 6.33 in for July). August was dry (1.90 in). Weed control was good. Two hybrids had greater than 10% lodging at harvest.

2023 Dryland Forage Sorghum Hybrid Performance Trial Feed Quality at Walsh

			Forage Quality[a]													
Brand	Hybrid	Forage Yield[b]	RFQ	CP	aNDFom	Lignin	WSC Sugar	Starch	Fat	Ash	NDFD 30hr	NDFD 240hr	TDN Milk	NEL	Milk/Ton	Beef/Ton
		tons/ac		percent										Mcal/cwt	lb/ton	lb/ton
Dyna-Gro Seed	Super Sile 30	**13.4**	120	7.2	52	4	12	10	2	6	52	67	61	66	3012	148
Dyna-Gro Seed	F72FS05	11.0	135	7.6	50	3	10	17	2	9	58	72	62	66	3015	166
Dyna-Gro Seed	Fullgraze II	10.7	110	8.1	59	4	9	5	2	4	55	71	60	65	2974	150
Sorghum Partners	SS405	10.7	126	8.0	53	4	13	7	2	4	55	72	63	69	3198	189
Dyna-Gro Seed	Super Sile 20	10.5	123	8.6	52	4	11	6	2	8	55	74	60	65	2954	162
Sorghum Partners	SP2707 DT	10.5	140	9.6	47	4	10	18	3	3	52	68	66	73	3447	216
Sorghum Partners	SP2606 BMR	10.3	125	8.2	51	5	10	13	2	7	54	72	61	66	3029	164
Dyna-Gro Seed	F74FS23 BMR	10.1	161	9.0	46	3	12	12	3	5	61	74	68	72	3461	241
Dyna-Gro Seed	Danny Boy II BMR	10.0	135	11.4	55	5	7	2	2	7	63	77	64	66	3087	203
Dyna-Gro Seed	F74FS72 BMR	9.5	136	9.6	43	4	11	8	3	6	57	73	66	72	3413	227
Dyna-Gro Seed	Fullgraze II BMR	9.4	128	8.8	57	5	9	4	2	5	62	75	64	67	3121	195
Dyna-Gro Seed	Sweet Ton MS	9.3	137	7.2	46	4	14	18	3	2	47	65	66	75	3517	212
Sorghum Partners	NK300	8.7	143	10.1	48	4	11	18	2	5	55	69	65	72	3375	209
Dyna-Gro Seed	F72FS25 BMR	8.5	141	7.9	50	3	13	8	3	8	60	74	63	67	3090	189
Dyna-Gro Seed	F75FS13	8.3	147	7.8	46	3	12	21	2	4	53	69	66	73	3447	213
Dyna-Gro Seed	F71FS72 BMR	8.2	204	8.8	36	4	12	38	3	4	54	65	72	80	3908	251
Sorghum Partners	SP1727 MS BMR	8.1	157	9.5	45	4	14	12	3	8	59	72	65	70	3290	213
Dyna-Gro Seed	Dynagraze II BMR	7.8	141	8.5	52	4	11	9	2	7	62	75	64	67	3116	195
Dyna-Gro Seed	Super Sweet 10	6.0	120	8.3	52	4	11	16	2	7	54	69	61	66	3020	151
Dyna-Gro Seed	Dynagraze II	5.9	135	8.7	47	4	11	19	2	5	51	66	64	71	3284	184
	Average	**9.3**	**138**	**8.6**	**49**	**4.0**	**11.2**	**13**	**2**	**6**	**56**	**71**	**64**	**69**	**3,238**	**194**
	[c]LSD (0.20)	1.01														
	[c]LSD (0.05)	1.56														

[a]All forage quality analyses results are dry basis values. CP=crude protein; aNDFom=ash free neutral detergent fiber; NDFD=neutral detergent fiber digestibility; TDN=total digestable nutrients; NEL=net energy for lactation; Milk/ton= predicted amount of milk produced per ton of silage dry matter calculated using MILK2013.

[b]Yields are adjusted to 65% moisture content based on oven-dried samples. Yields in bold are in the top LSD (.20) group and are not significantly different from one another.

[c]Farmers selecting a hybrid based on yield should use the LSD (.20) to protect themselves from false negative conclusions (concluding hybrids are the same when they are actually different). Companies or researchers may be interested in the LSD (.05) to avoid false positive conclusions (concluding hybrids are different when they are actually the same). Yield differences less than the LSD value are considered the same.

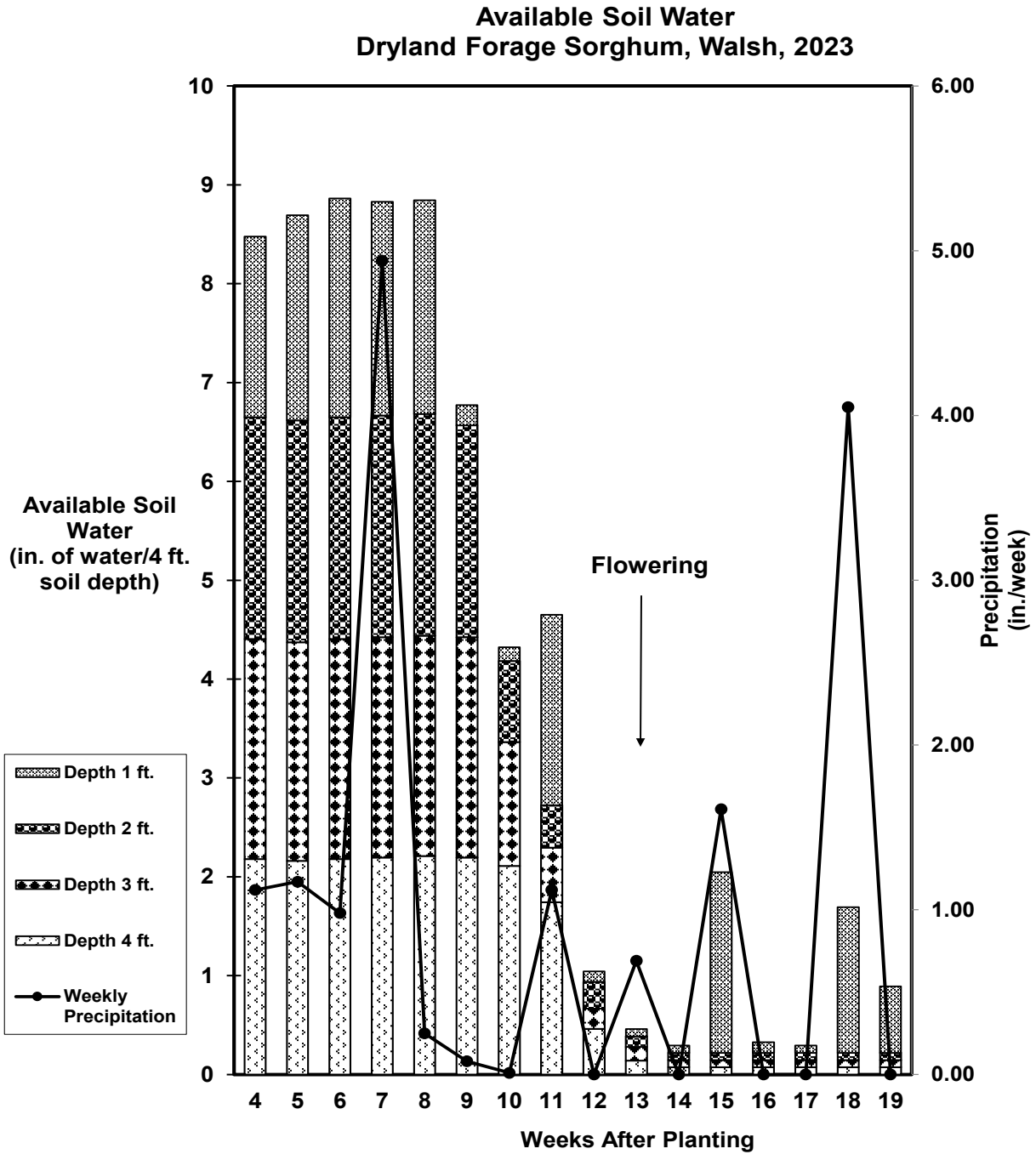


Fig. 3. Available soil water in dryland forage sorghum at Walsh. Gypsum block measurements taken to 4 ft. with 1 ft. increments. Total rainfall at Walsh from planting (June 2) to first freeze (October 15) was 19.13 in. Any increase in available soil water between weeks is from rain.

2023 Irrigated Forage Sorghum Variety Performance Trial at Fruita

Variety	Brand	Yield			Moisture	Brix	50% Bloom	Plant Height	Forage Type[b]	Relative Maturity[c]	Traits[d]	RFQ[e]
		Forage[a]	Dry Matter	Yield								
		tons/ac		% of test average	% at harvest	percent	date	feet				percent
SS405	Sorghum Partners	**55.8**	**19.5**	135%	71	11	24-Aug	10.5	FS	ML	-	97
ADV S6218	Alta Seeds	**55.2**	**19.3**	134%	67	11	18-Aug	9.8	SS	ME	DS	87
Super Sweet 10	Dyna-Gro Seed	**54.5**	**19.1**	132%	66	10	22-Aug	9.7	SS	M	-	123
Super Sile 30	Dyna-Gro Seed	**52.8**	**18.5**	128%	71	8	26-Aug	7.9	FS	ME	-	107
Dynagraze II BMR	Dyna-Gro Seed	**51.7**	**18.1**	125%	65	12	21-Aug	10.1	SS	ME	BMR	88
SweetTon MS	Dyna-Gro Seed	51.5	18.0	125%	65	12	26-Aug	10.8	GS	ML	SCA	129
ADV XF051	Alta Seeds	46.9	16.4	113%	70	12	19-Aug	8.1	-	ME	-	158
ADV XF171	Alta Seeds	46.4	16.2	112%	67	10	20-Aug	7.7	-	ME	-	130
F74FS23 BMR	Dyna-Gro Seed	46.2	16.2	112%	73	9	23-Aug	8.9	FS	M	BMR, BD	135
Fullgraze II BMR	Dyna-Gro Seed	42.9	15.0	104%	71	9	26-Aug	10.0	SS	ML	BMR	97
F75FS13	Dyna-Gro Seed	42.7	14.9	103%	74	6	21-Aug	10.3	FS	M	-	121
ADV F7102	Alta Seeds	42.3	14.8	102%	75	7	19-Aug	8.0	FS	ME	BMR	93
Fullgraze II	Dyna-Gro Seed	41.7	14.6	101%	65	13	21-Aug	12.4	SS	ML	-	92
Dynagraze II	Dyna-Gro Seed	41.7	14.6	101%	66	13	18-Aug	9.2	SS	ME	-	131
ADV F8322	Alta Seeds	41.5	14.5	100%	66	10	21-Aug	7.2	FS	M	SCA	123
Super Sile 20	Dyna-Gro Seed	41.5	14.5	100%	66	6	22-Aug	9.4	FS	ML	-	92
ADV XS005	Alta Seeds	41.3	14.5	100%	74	8	2-Sep	9.6	-	M	-	108
SP1727 MS BMR	Sorghum Partners	41.0	14.3	99%	77	9	27-Aug	9.1	FS	M	MS, BMR	104
SP2707 DT	Sorghum Partners	40.7	14.2	99%	68	9	20-Aug	5.9	FS	ME	DT	130
SP2606 BMR	Sorghum Partners	39.4	13.8	95%	74	7	20-Aug	7.7	FS	ME	BMR	107
Danny Boy II BMR	Dyna-Gro Seed	38.1	13.3	92%	77	7	31-Aug	10.2	SS	ME	BMR	157
NK300	Sorghum Partners	37.3	13.1	90%	73	7	20-Aug	7.6	FS	ME	-	108
ADV S5501	Alta Seeds	35.8	12.5	87%	73	5	25-Aug	11.0	SS	PS	-	120
F71FS72 BMR	Dyna-Gro Seed	35.7	12.5	87%	76	7	23-Aug	7.8	FS	E	BMR	124
ADV XS060	Alta Seeds	34.2	12.0	83%	68	9	4-Sep	11.9	-	M	-	91
ADV F7232	Alta Seeds	31.0	10.9	75%	68	10	24-Aug	6.0	FS	M	BD, SCA	101
F72FS25 BMR	Dyna-Gro Seed	27.1	9.5	66%	71	10	2-Sep	9.2	FS	M	BMR	130
F74FS72 BMR	Dyna-Gro Seed	22.1	7.8	54%	74	12	23-Aug	10.0	FS	M	BMR	148
F72FS05	Dyna-Gro Seed	18.9	6.6	46%	72	11	23-Aug	6.9	FS	ME	-	102
	Average	**41.3**	**14.5**		**70**	**9**	**23-Aug**	**9.1**				**115**
	[f]LSD (0.30)	4.2	1.5									
	[f]LSD (0.05)	8.1	2.8									
	Coefficient of Variation (CV)	11.7										

[a]Forage yield adjusted to 65% moisture content based on dried samples.

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

[c]Relative maturities are provided by the companies. E=early; ME=medium-early; M=medium; ML=medium-late; PS=Photoperiod sensitive.

[d]Traits are provided by the companies. Dashes mean conventional (no traits) or information isn't available. BD=brachytic dwarf; BMR=brown mid-rib; DT=DoubleTeam herbicide technology; DS=dry stalk; MS=male sterile; SCA=sugar cane aphid.

[e]Forage quality analyses based on oven-dried weight. RFQ=relative forage quality.

[f]If the difference between two variety yields equals or exceeds the LSD value, the difference is significant. Farmers selecting a variety based on yield should use the LSD (0.30) to protect from false negative decisions. Companies or researchers may be interested in the LSD (0.05) to avoid false positive conclusions.

Site Information

Collaborator: CSU Grand Valley Research Center (Sri Pinnamaneni and Jim Fry)
Planting Date: May 28, 2023
Harvest Date: September 13-23, 2023
Herbicide: Pre-plant: Glyphosate; Post-Plant: Fluroxypyr @ 20 oz/ac
Soil Type: Sagers silty clay loam
GPS Coordinates: 39.179467, -108.700397

2023 Irrigated Forage Sorghum Variety Performance Feed Quality Trial at Fruita

			Forage Quality[a]												
Variety	Brand	Forage Yield[b]	RFQ	CP	aNDFom	Lignin	WSC (Sugar)	Starch	Ash	Fat	NDFD 30hr	NDFD 240hr	TDN	NEL	Milk/Ton
		tons/ac	percent											Mcal/cwt	lb/ton
SS405	Sorghum Partners	**55.8**	97	6.0	56	5.1	6.6	14	11	2	52	68	64	58	2492
ADV S6218	Alta Seeds	**55.2**	87	6.1	66	5.4	8.5	2	10	2	56	69	62	54	2235
Super Sweet 10	Dyna-Gro Seed	**54.5**	123	5.3	49	3.7	14.8	10	10	2	55	69	65	63	2828
Super Sile 30	Dyna-Gro Seed	**52.8**	107	8.1	53	5.1	9.5	9	9	2	52	70	65	62	2745
Dynagraze II BMR	Dyna-Gro Seed	**51.7**	88	5.6	51	4.9	10.2	2	12	2	54	67	63	59	2576
SweetTon MS	Dyna-Gro Seed	51.5	129	7.4	46	4.1	12.3	7	10	2	58	71	66	66	3008
ADV XF051	Alta Seeds	46.9	158	7.7	43	3.7	14.2	18	9	3	57	70	67	69	3195
ADV XF171	Alta Seeds	46.4	130	5.1	50	4.4	9.2	19	11	3	58	69	65	63	2829
F74FS23 BMR	Dyna-Gro Seed	46.2	135	6.1	48	3.5	11.0	16	11	3	58	70	66	64	2885
Fullgraze II BMR	Dyna-Gro Seed	42.9	97	4.8	41	5.4	13.0	13	8	2	44	60	65	69	3070
F75FS13	Dyna-Gro Seed	42.7	121	5.5	48	4.8	12.1	17	8	3	50	66	65	66	2950
ADV F7102	Alta Seeds	42.3	93	7.0	62	4.9	8.5	2	12	2	56	70	63	55	2299
Fullgraze II	Dyna-Gro Seed	41.7	92	4.0	55	4.5	10.2	9	10	2	52	68	64	59	2547
Dynagraze II	Dyna-Gro Seed	41.7	131	6.5	50	3.9	13.9	5	11	2	60	74	66	62	2816
ADV F8322	Alta Seeds	41.5	123	5.3	52	4.8	11.6	10	11	2	58	70	65	62	2759
Super Sile 20	Dyna-Gro Seed	41.5	92	4.3	62	5.2	11.1	7	7	2	52	69	63	59	2560
ADV XS005	Alta Seeds	41.3	108	5.2	51	4.2	9.9	15	11	3	54	67	65	61	2685
SP1727 MS BMR	Sorghum Partners	41.0	104	6.5	55	4.6	9.5	10	10	2	54	68	64	59	2569
SP2707 DT	Sorghum Partners	40.7	130	7.7	50	3.5	11.2	4	13	2	65	71	65	62	2838
SP2606 BMR	Sorghum Partners	39.4	107	5.9	58	4.8	10.7	3	10	2	58	72	64	59	2580
Danny Boy II BMR	Dyna-Gro Seed	38.1	157	5.2	42	3.4	13.0	24	8	3	53	66	66	70	3266
NK300	Sorghum Partners	37.3	108	7.3	47	3.8	10.9	3	10	2	58	66	64	65	2939
ADV S5501	Alta Seeds	35.8	120	6.1	43	4.1	12.1	20	9	2	48	62	66	67	3025
F71FS72 BMR	Dyna-Gro Seed	35.7	124	5.7	51	4.3	13.5	10	8	2	54	71	65	65	2962
ADV XS060	Alta Seeds	34.2	91	5.3	61	5.1	6.6	10	11	2	54	69	64	56	2378
ADV F7232	Alta Seeds	31.0	101	5.8	44	4.1	10.3	7	12	2	53	66	64	63	2826
F72FS25 BMR	Dyna-Gro Seed	27.1	130	6.0	51	2.7	13.2	7	12	2	60	73	65	62	2768
F74FS72 BMR	Dyna-Gro Seed	22.1	148	7.8	45	3.6	15.9	4	11	3	59	74	67	66	3039
F72FS05	Dyna-Gro Seed	18.9	102	4.4	54	4.2	11.4	12	10	2	51	64	64	60	2588
	Average	**41.3**	**115**	**6.0**	**51**	**4.3**	**11.2**	**10**	**10**	**2**	**55**	**69**	**65**	**62**	**2767**
	[c]LSD (0.30)	4.2													
	[c]LSD (0.05)	8.1													
	Coefficient of Variation (CV)	11.7													

[a]All forage quality analyses results are dry basis values. CP=crude protein; aNDFom=ash free neutral detergent fiber; WSC=water-soluble carbohydrates; NDFD=neutral detergent fiber digestibility; TDN=total digestable nutrients; NEL=net energy for lactation; Milk/ton=predicted amount

[b]Forage yield adjusted to 65% moisture content based on dried samples.

[c]If the difference between two variety yields equals or exceeds the LSD value, the difference is significant. Farmers selecting a variety based on yield should use the LSD (0.30) to protect from false negative decisions. Companies or researchers may be interested in the LSD (0.05) to avoid false positive conclusions.

2023 Irrigated Forage Sorghum Variety Performance Trial at Rocky Ford

Variety	Brand	Yield				Moisture	Brix	Plant Height	Forage Type[b]	Relative Maturity[c]	Traits[d]	RFQ[e]
		Forage[a]	Dry Matter	Yield	3-Year Forage Average							
		tons/ac		% of test average	tons/ac	% at harvest	percent	in				percent
Danny Boy II BMR	Dyna-Gro Seed	**31.4**	11.0	155%	31.1	80	11	135	SS	ME	BMR	122
Fullgraze II	Dyna-Gro Seed	27.3	9.5	135%	32.0	64	7	122	SS	ML	-	127
Fullgraze II BMR	Dyna-Gro Seed	26.1	9.1	129%	27.1	62	12	111	SS	ML	BMR	146
Drylander	Star Seed	25.4	8.9	126%	-	80	8	122	SS	PS	BMR	117
Dynagraze II BMR	Dyna-Gro Seed	23.1	8.1	114%	24.6	70	7	76	SS	ME	BMR	131
Super Sile 20	Dyna-Gro Seed	22.9	8.0	113%	28.9	69	4	63	FS	ML	-	148
SweetTon MS	Dyna-Gro Seed	22.3	7.8	110%	24.4	73	14	113	GS	ML	SCA	131
Excell II	Star Seed	22.2	7.8	110%	-	70	9	122	SS	L	-	144
ADV F8484IG	Alta Seeds	21.8	7.6	108%	-	69	6	66	FS	ML	IG, BD	154
Super Sweet 10	Dyna-Gro Seed	20.2	7.1	100%	-	65	14	62	SS	M	-	136
F75FS13	Dyna-Gro Seed	20.2	7.1	100%	-	71	4	103	FS	M	-	147
Dynagraze II	Dyna-Gro Seed	19.6	6.9	97%	22.3	65	10	58	SS	ME	-	162
Super Sile 30	Dyna-Gro Seed	19.3	6.8	95%	26.1	64	6	93	FS	ME	-	150
Packer HGY	Star Seed	17.8	6.2	88%	-	63	13	61	FS	ML	-	138
F71FS72 BMR	Dyna-Gro Seed	17.5	6.1	86%	18.5	66	6	70	FS	E	BMR	150
ADV F8322	Alta Seeds	16.9	5.9	84%	22.8	59	7	59	FS	M	SCA	150
F72FS25 BMR	Dyna-Gro Seed	16.4	5.7	81%	18.8	66	8	54	FS	M	BMR	121
F72FS05	Dyna-Gro Seed	16.2	5.7	80%	22.7	61	11	133	FS	ME	-	125
ADV F7424	Alta Seeds	15.4	5.4	76%	-	68	8	64	FS	L	BMR, SCA	142
F74FS72 BMR	Dyna-Gro Seed	14.7	5.1	73%	16.9	65	2	75	FS	M	BMR	170
F74FS23 BMR	Dyna-Gro Seed	14.4	5.0	71%	17.5	66	13	62	FS	M	BMR, BD	161
ADV F7232	Alta Seeds	14.1	4.9	70%	-	67	4	99	FS	M	SCA	156
	Average	**20.2**	**7.1**		**23.8**	**67**	**8**	**87**				**142**
	[f]LSD (0.30)	1.4	0.5									
	[f]LSD (0.05)	2.7	0.9									
	Coefficient of Variation (CV)	10.4										

[a]Forage yield adjusted to 65% moisture content based on dried samples.

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

[c]Relative maturities are provided by the companies. E=early; ME=medium-early; M=medium; ML=medium-late; L=late; PS=Photoperiod sensitive.

[d]Traits are provided by the companies. Dashes mean conventional (no traits) or information isn't available. BD=brachytic dwarf; BMR=brown mid-rib; IG=iGrowth herbicide technology; SCA=sugar cane aphid.

[e]Forage quality analyses based on oven-dried weight. RFQ=relative forage quality.

[f]If the difference between two variety yields equals or exceeds the LSD value, the difference is significant. Farmers selecting a variety based on yield should use the LSD (0.30) to protect from false negative decisions. Companies or researchers may be interested in the LSD (0.05) to avoid false positive conclusions.

Site Information

Collaborator:	CSU Arkansas Valley Research Center (Kevin Tanabe)
Planting Date:	May 16, 2023
Harvest Date:	September 20, 2023
Fertilizer:	Pre-plant: N at 8, P at 21, and K at 2.6 lb/ac; Side-dress: N at 106 lb/ac
Herbicide:	None
Soil Type:	Rocky Ford silty clay loam
GPS Coordinates:	38.0389, -103.6933
Trial Comments:	Planted into good moisture, excellent plant stands and hand-weeded once to control volunteer dry beans and camelina. Trial was irrigated three times, each time receiving 2 inches of water.

2023 Irrigated Forage Sorghum Variety Performance Feed Quality Trial at Rocky Ford

			Forage Quality[a]												
Variety	Brand	Forage Yield[b]	RFQ	CP	aNDFom	Lignin	WSC (Sugar)	Starch	Ash	Fat	NDFD 30hr	NDFD 240hr	TDN	NEL	Milk/Ton
		tons/ac					percent							Mcal/cwt	lb/ton
Danny Boy II BMR	Dyna-Gro Seed	**31.4**	122	9.4	61	4.5	4.5	0	9	2	57	70	56	60	2611
Fullgraze II	Dyna-Gro Seed	27.3	127	8.1	61	5.2	4.8	6	6	2	50	65	56	63	2790
Fullgraze II BMR	Dyna-Gro Seed	26.1	146	8.1	50	3.8	6.4	14	7	3	53	64	62	69	3177
Drylander	Star Seed	25.4	117	7.0	65	4.6	3.9	2	7	2	56	71	56	61	2671
Dynagraze II BMR	Dyna-Gro Seed	23.1	131	7.5	51	4.3	6.4	13	7	2	49	67	59	66	2969
Super Sile 20	Dyna-Gro Seed	22.9	148	8.3	49	4.1	5.8	18	6	2	50	66	62	70	3203
SweetTon MS	Dyna-Gro Seed	22.3	131	6.4	48	3.6	12.6	10	5	2	45	65	60	70	3154
Excell II	Star Seed	22.2	144	8.2	52	4.4	9.1	11	6	2	50	65	61	69	3162
ADV F8484IG	Alta Seeds	21.8	154	8.1	46	3.9	6.0	23	7	3	52	66	63	71	3291
Super Sweet 10	Dyna-Gro Seed	20.2	136	7.6	46	4.7	6.5	16	8	2	45	59	60	69	3068
F75FS13	Dyna-Gro Seed	20.2	147	7.5	48	4.0	6.9	17	6	2	50	64	63	71	3281
Dynagraze II	Dyna-Gro Seed	19.6	162	8.4	41	4.0	8.9	21	5	3	45	58	65	75	3500
Super Sile 30	Dyna-Gro Seed	19.3	150	8.1	37	3.0	10.1	30	7	2	45	59	66	75	3487
Packer HGY	Star Seed	17.8	138	7.1	41	3.1	8.8	25	7	2	45	62	63	72	3313
F71FS72 BMR	Dyna-Gro Seed	17.5	150	7.7	32	2.5	10.7	30	8	3	41	57	67	77	3566
ADV F8322	Alta Seeds	16.9	150	7.1	38	3.0	8.6	29	6	3	47	62	67	76	3599
F72FS25 BMR	Dyna-Gro Seed	16.4	121	7.5	48	3.6	5.5	16	11	2	48	62	57	64	2791
F72FS05	Dyna-Gro Seed	16.2	125	7.3	46	4.1	5.9	20	8	2	43	59	58	67	2978
ADV F7424	Alta Seeds	15.4	142	7.6	33	2.0	10.0	32	7	3	40	55	66	76	3511
F74FS72 BMR	Dyna-Gro Seed	14.7	170	9.1	33	2.5	9.3	31	7	3	53	62	69	78	3732
F74FS23 BMR	Dyna-Gro Seed	14.4	161	8.1	33	2.3	11.5	29	7	3	47	58	69	78	3689
ADV F7232	Alta Seeds	14.1	156	8.4	41	3.2	7.5	23	8	3	52	64	65	72	3389
	Average	**20.2**	**142**	**7.8**	**45**	**3.6**	**7.7**	**19**	**7**	**2**	**48**	**63**	**62**	**70**	**3224**
	[c]LSD (0.30)	1.4													
	[c]LSD (0.05)	2.7													
	Coefficient of Variation (CV)	10.4													

[a]All forage quality analyses results are dry basis values. CP=crude protein; aNDFom=ash free neutral detergent fiber; WSC=water-soluble carbohydrates; NDFD=neutral detergent fiber digestibility; TDN=total digestable nutrients; NEL=net energy for lactation; Milk/ton=predicted amount of milk produced per ton of silage dry matter calculated using MILK2013.
[b]Forage yield adjusted to 65% moisture content based on dried samples.

[c]If the difference between two variety yields equals or exceeds the LSD value, the difference is significant. Farmers selecting a variety based on yield should use the LSD (0.30) to protect from false negative decisions. Companies or researchers may be interested in the LSD (0.05) to avoid false positive conclusions.

COLORADO STATE UNIVERSITY EXTENSION

2023 Dryland Grain Sorghum Input Product Trial at Akron

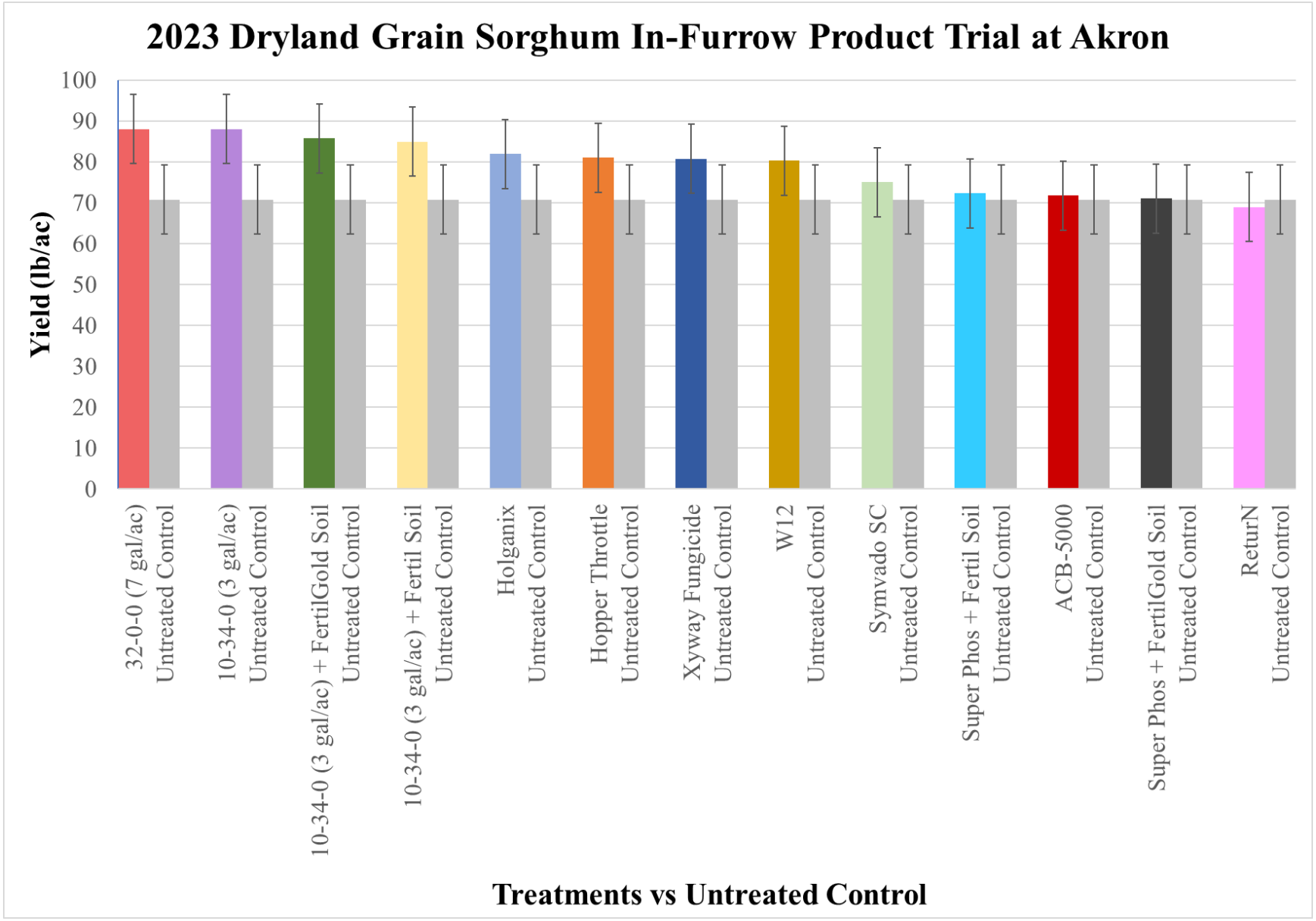
Crops Testing www.csucrops.com

Company	Application Type	Treatment[a]	Yield[b]	Test Weight	Moisture	Population
			bu/ac	lb/bu	percent	plants/ac
None	Liquid Side Dribble	32-0-0 (7 gal/ac)	88*	57	13	33,237
None	*n/a*	*Untreated Control*	*71*	*57*	*12*	*32,505*
None	Liquid In-Furrow	10-34-0 (3 gal/ac)	88*	57	13	31,739
None	*n/a*	*Untreated Control*	*71*	*57*	*12*	*32,505*
Bio Huma Netics	Liquid In-Furrow	10-34-0 (3 gal/ac) + FertilGold Soil	86	58	13	29,967
None	*n/a*	*Untreated Control*	*71*	*57*	*12*	*32,505*
Bio Huma Netics	Liquid In-Furrow	10-34-0 (3 gal/ac) + Fertil Soil	85	57	13	30,504
None	*n/a*	*Untreated Control*	*71*	*57*	*12*	*32,505*
Holganix	Liquid In-Furrow	Holganix	82	57	12	34,262
None	*n/a*	*Untreated Control*	*71*	*57*	*12*	*32,505*
Meristem Ag.	Dry Seed Treatment	Hopper Throttle	81	57	13	32,798
None	*n/a*	*Untreated Control*	*71*	*57*	*12*	*32,505*
FMC	Liquid In-Furrow	Xyway Fungicide	81	57	12	34,018
None	*n/a*	*Untreated Control*	*71*	*57*	*12*	*32,505*
Indigo Ag.	Dry Seed Treatment	W12	80	57	12	34,555
None	*n/a*	*Untreated Control*	*71*	*57*	*12*	*32,505*
Valent BioSciences	Liquid In-Furrow	Symvado SC	75	56	12	34,116
None	*n/a*	*Untreated Control*	*71*	*57*	*12*	*32,505*
Bio Huma Netics	Liquid In-Furrow	Super Phos + Fertil Soil	72	57	13	30,358
None	*n/a*	*Untreated Control*	*71*	*57*	*12*	*32,505*
Van Grow	Dry In-Furrow	ACB-5000	72	56	12	31,331
None	*n/a*	*Untreated Control*	*71*	*57*	*12*	*32,505*
Bio Huma Netics	Liquid In-Furrow	Super Phos + FertilGold Soil	71	56	12	30,358
None	*n/a*	*Untreated Control*	*71*	*57*	*12*	*32,505*
Pivot Bio	Liquid In-Furrow	ReturN	69	57	12	33,140
None	*n/a*	*Untreated Control*	*71*	*57*	*12*	*32,505*
			79	**57**	**13**	**32,300**
		Replicates	6	6	6	6
		[c]P-value (0.05)	0.01			

[a]All treatment products were applied at the labeled or instructed rate. Liquid products were not opened or mixed until after arrival at the field site and were mixed with unchlorinated water as a carrier.
[b]Yield corrected to 14% moisture. Treatment yields with an asterisk means they were signifantly higher yielding than the control at an alpha level of 0.10 and using a Dunnett adjusted P-value.
[c]The P-value shows that treatment yields were statistically different from one another, but only two treatments were different from the control.

Site Information

Collaborator:	USDA-ARS Central Great Plains Research Center
Planting Date:	June 9, 2023
Harvest Date:	October 17, 2023
Fertilizer:	Pre-emerge: N at 50 lb/ac
Soil Type:	Weld silt loam
Pre-Plant Soil Test Results:	Nitrate-N at 22 lb/ac available in top 2 feet, phosphorus at 12 ppm (bicarb) in top foot, organic matter at 1.3 percent, pH of 6.3 (higher under first foot), soluble salts at 0.34 mmhos/cm, Sulfate-S at 3 ppm, K at 450 ppm, Fe at 13.8 ppm, Mg at 313 ppm, Zn at 0.2 ppm, Mn at 2.8 ppm, Cu at 0.4 ppm, and B at 0.3 ppm
Trial Comments:	Planted June 1st into excellent moisture. Average stands and emergence. Very timely and frequent rainfall allowed for excellent yield. Good weed control throughout the season. No lodging noted at harvest. Radar estimates showed the trial received 12.8 inches of rain from planting to harvest, and 22 inches since January 1st, which is 138% of the ten-year average (year-to-date).


2023 Dryland Grain Sorghum In-Furrow Product Trial at Akron
Yield (lb/ac)
100
90
80
70
60
50
40
30
20
10
0
32-0-0 (7 gal/ac)
Untreated Control
10-34-0 (3 gal/ac)
Untreated Control
10-34-0 (3 gal/ac) + FertilGold Soil
Untreated Control
10-34-0 (3 gal/ac) + Fertil Soil
Untreated Control
Holganix
Untreated Control
Hopper Throttle
Untreated Control
Xyway Fungicide
Untreated Control
W12
Untreated Control
Symvado SC
Untreated Control
Super Phos + Fertil Soil
Untreated Control
ACB-5000
Untreated Control
Super Phos + FertilGold Soil
Untreated Control
ReturN
Untreated Control
Treatments vs Untreated Control

COLORADO STATE UNIVERSITY EXTENSION

2023 Dryland Grain Sorghum Input Product Trial at Sheridan Lake

Crops Testing www.csucrops.com

Company	Application Type	Treatment[a]	Yield[b]	Test Weight	Moisture	Population
			bu/ac	lb/bu	percent	plants/ac
Van Grow	Dry In-Furrow	ACB-5000	122	57	13	33,906
None	*n/a*	*Untreated Control*	*114*	*57*	*13*	*32,210*
Bio Huma Netics	Liquid In-Furrow	Super Phos + Fertil Soil	119	56	12	31,052
None	*n/a*	*Untreated Control*	*114*	*57*	*13*	*32,210*
Meristem Ag.	Dry Seed Treatment	Hopper Throttle	117	57	12	35,560
None	*n/a*	*Untreated Control*	*114*	*57*	*13*	*32,210*
Valent BioSciences	Liquid In-Furrow	Symvado SC	116	57	13	32,002
None	*n/a*	*Untreated Control*	*114*	*57*	*13*	*32,210*
FMC	Liquid In-Furrow	Xyway Fungicide	114	57	13	33,244
None	*n/a*	*Untreated Control*	*114*	*57*	*13*	*32,210*
Indigo Ag.	Dry Seed Treatment	W12	112	57	13	34,785
None	*n/a*	*Untreated Control*	*114*	*57*	*13*	*32,210*
Bio Huma Netics	Liquid In-Furrow	10-34-0 (3 gal/ac) + FertilGold Soil	112	57	13	30,235
None	*n/a*	*Untreated Control*	*114*	*57*	*13*	*32,210*
None	Liquid In-Furrow	10-34-0 (3 gal/ac)	112	57	13	31,022
None	*n/a*	*Untreated Control*	*114*	*57*	*13*	*32,210*
Bio Huma Netics	Liquid In-Furrow	Super Phos + FertilGold Soil	110	57	13	33,208
None	*n/a*	*Untreated Control*	*114*	*57*	*13*	*32,210*
Pivot Bio	Liquid In-Furrow	ReturN	107	57	14	33,937
None	*n/a*	*Untreated Control*	*114*	*57*	*13*	*32,210*
Bio Huma Netics	Liquid In-Furrow	10-34-0 (3 gal/ac) + Fertil Soil	107	56	12	30,588
None	*n/a*	*Untreated Control*	*114*	*57*	*13*	*32,210*
			115	**57**	**13**	**32,400**
		Replicates	6	6	6	6
		[c]P-value	0.65, NS			

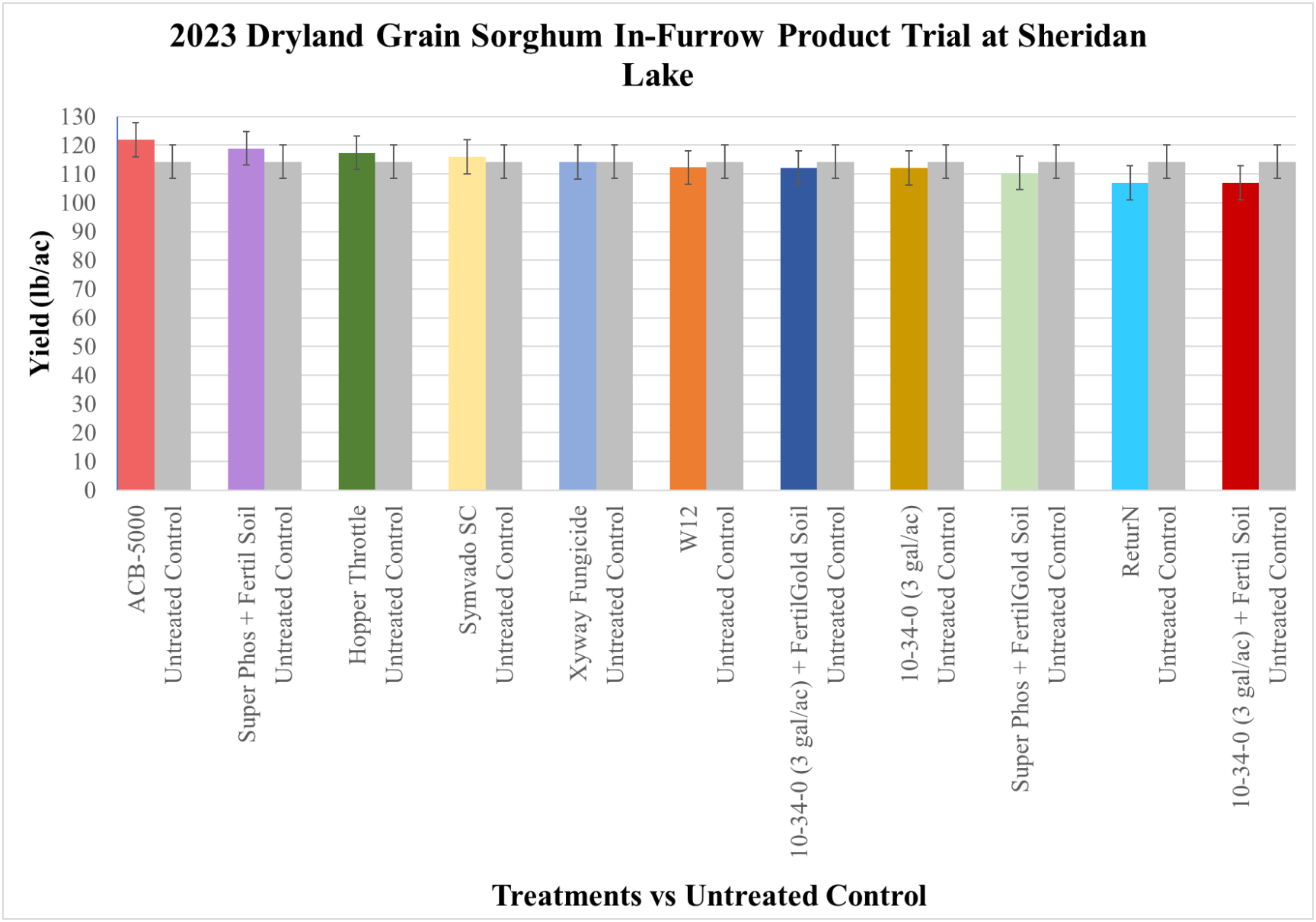
[a]All treatment products were applied at the labeled or instructed rate. Liquid products were not opened or mixed until after arrival at the field site and were mixed with unchlorinated water as a carrier.

[b]Yield corrected to 14% moisture.

[c]The P-value shows that treatment yields were not statistically different from one another, nor were they different from the control (Dunnett's adjustment used).

Site Information

Collaborator:	Scherler Farms
Planting Date:	May 31, 2023
Harvest Date:	November 17, 2023
Fertilizer:	Pre-plant: N at 50 lb/ac
Soil Type:	Olney sandy loam
Pre-Plant Soil Test Results:	Nitrate-N at 110 lb/ac available in top 2 feet, phosphorus at 7 ppm (bicarb) in top foot, organic matter at 1.2 percent, pH of 7.7, soluble salts at 1.02 mmhos/cm, Sulfate-S at 7 ppm, K at 666 ppm, Fe at 5.3 ppm, Mg at 301 ppm, Zn at 0.5 ppm, Mn at 2 ppm, Cu at 0.9 ppm, and B at 1.1 ppm
Trial Comments:	Planted 1.5" deep into moisture. Very good stands and emergence and excellent weed control throughout the season. Trial average flowering date of August 10th. Radar estimates showed the trial received about 10.2 inches of rain from planting to harvest, and 17.9 inches since January 1st, which is 121% of the ten-year average (year-to-date).


2023 Dryland Grain Sorghum In-Furrow Product Trial at Sheridan Lake
Yield (lb/ac)
130
120
110
100
90
80
70
60
50
40
30
20
10
0
ACB-5000
Untreated Control
Super Phos + Fertil Soil
Untreated Control
Hopper Throttle
Untreated Control
Symvado SC
Untreated Control
Xyway Fungicide
Untreated Control
W12
Untreated Control
10-34-0 (3 gal/ac) + FertilGold Soil
Untreated Control
10-34-0 (3 gal/ac)
Untreated Control
Super Phos + FertilGold Soil
Untreated Control
ReturN
Untreated Control
10-34-0 (3 gal/ac) + Fertil Soil
Untreated Control
Treatments vs Untreated Control

COLORADO STATE UNIVERSITY EXTENSION

2023 Irrigated Grain Sorghum Input Product Trial at Wiggins

Crops Testing www.csucrops.com

Company	Application Type	Treatment[a]	Yield[b]	Test Weight	Moisture	Population
			bu/ac	lb/bu	percent	plants/ac
Bio Huma Netics	Liquid In-Furrow	10-34-0 (3 gal/ac) + FertilGold Soil	125	58	12	53,807
None	*n/a*	*Untreated Control*	*123*	*57*	*12*	*58,127*
FMC	Liquid In-Furrow	Xyway Fungicide	123	57	12	56,179
None	*n/a*	*Untreated Control*	*123*	*57*	*12*	*58,127*
Indigo Ag.	Dry Seed Treatment	W12	123	57	12	56,703
None	*n/a*	*Untreated Control*	*123*	*57*	*12*	*58,127*
Pivot Bio	Liquid In-Furrow	ReturN	122	57	12	53,704
None	*n/a*	*Untreated Control*	*123*	*57*	*12*	*58,127*
Van Grow	Dry In-Furrow	ACB-5000	116	57	12	57,486
None	*n/a*	*Untreated Control*	*123*	*57*	*12*	*58,127*
Bio Huma Netics	Liquid In-Furrow	Super Phos + FertilGold Soil	116	58	12	54,999
None	*n/a*	*Untreated Control*	*123*	*57*	*12*	*58,127*
Meristem Ag.	Dry Seed Treatment	Hopper Throttle	114	57	12	54,571
None	*n/a*	*Untreated Control*	*123*	*57*	*12*	*58,127*
Bio Huma Netics	Liquid In-Furrow	10-34-0 (3 gal/ac) + Fertil Soil	112	57	12	53,198
None	*n/a*	*Untreated Control*	*123*	*57*	*12*	*58,127*
Bio Huma Netics	Liquid In-Furrow	Super Phos + Fertil Soil	112	57	12	54,214
None	*n/a*	*Untreated Control*	*123*	*57*	*12*	*58,127*
Valent BioSciences	Liquid In-Furrow	Symvado SC	111	58	12	56,411
None	*n/a*	*Untreated Control*	*123*	*57*	*12*	*58,127*
None	Liquid In-Furrow	10-34-0 (3 gal/ac)	108	57	12	54,270
None	*n/a*	*Untreated Control*	*123*	*57*	*12*	*58,127*
			123	**57**	**12**	**57,800**
		Replicates	6	6	6	6
		[c]P-value	0.57, NS			

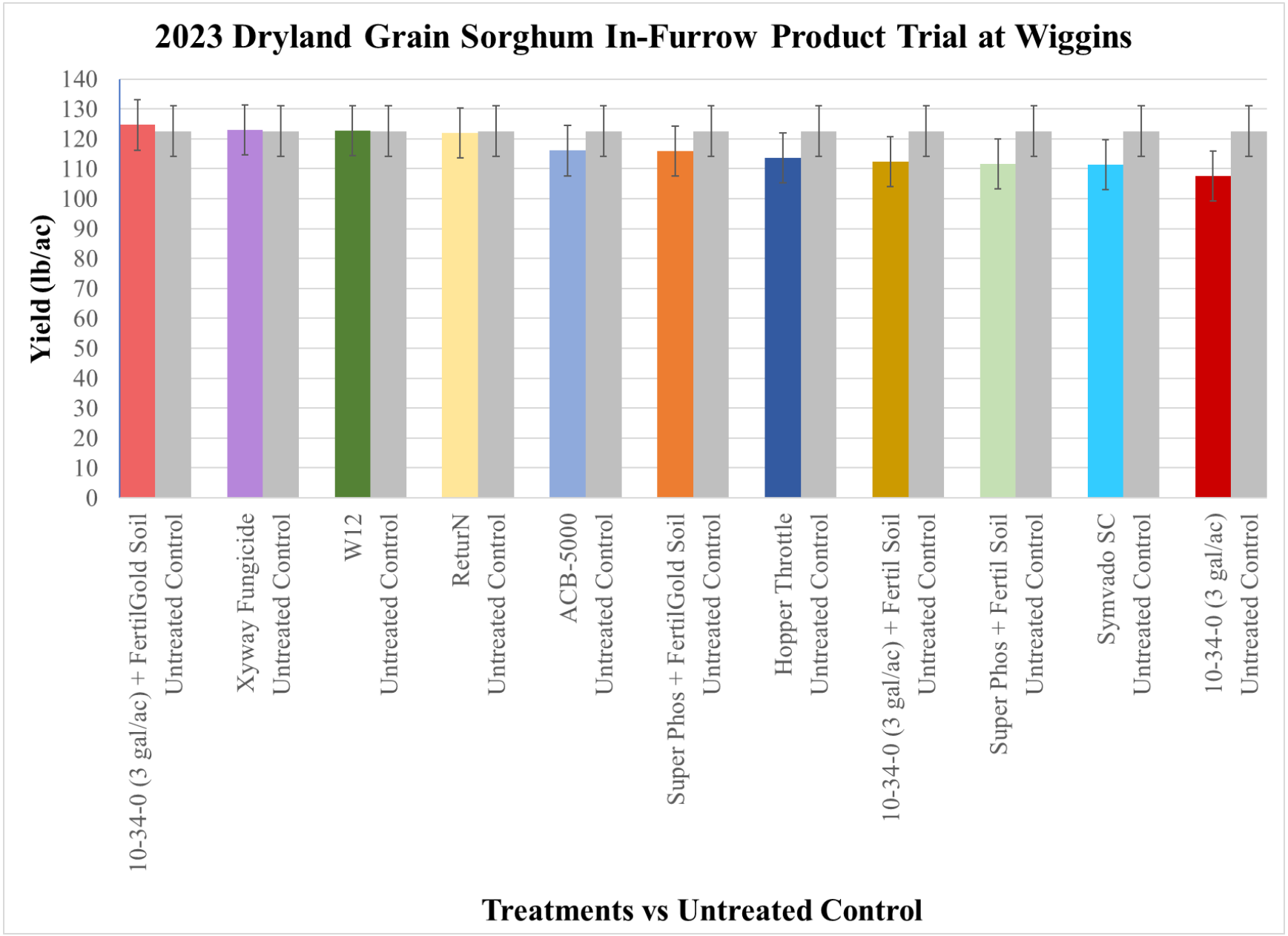
[a]All treatment products were applied at the labeled or instructed rate. Liquid products were not opened or mixed until after arrival at the field site and were mixed with unchlorinated water as a carrier.

[b]Yield corrected to 14% moisture.

[c]The P-value shows that treatment yields were not statistically different from one another, nor were they different from the control (Dunnett's adjustment used).

Site Information

Collaborator:	Cooksey Family Farms
Planting Date:	June 2, 2023
Harvest Date:	November 9, 2023
Soil Type:	Truckton sandy loam
Pre-Plant Soil Test Results:	Nitrate-N at 27 lb/ac available in top 2 feet, phosphorus at 19 ppm (bicarb) in top foot, organic matter at 1.2 percent, pH of 7.6, soluble salts at 1.76 mmhos/cm, Sulfate-S at 69 ppm, K at 184 ppm, Fe at 7.2 ppm, Mg at 186 ppm, Zn at 2.1 ppm, Mn at 3.3 ppm, Cu at 1.0 ppm, and B at 0.8 ppm
Trial Comments:	Trial had good emergence and stands. Field had moderate weed pressure mid-season, hand labor was used to clean up trial area. Radar estimates showed the trial received about 13 inches of rain from planting to harvest, and 23.5 inches since January 1st, which is 132% of the ten-year average (year-to-date).


2023 Dryland Grain Sorghum In-Furrow Product Trial at Wiggins
Yield (lb/ac)
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
10-34-0 (3 gal/ac) + FertilGold Soil
Untreated Control
Xyway Fungicide
Untreated Control
W12
Untreated Control
ReturN
Untreated Control
ACB-5000
Untreated Control
Super Phos + FertilGold Soil
Untreated Control
Hopper Throttle
Untreated Control
10-34-0 (3 gal/ac) + Fertil Soil
Untreated Control
Super Phos + Fertil Soil
Untreated Control
Symvado SC
Untreated Control
10-34-0 (3 gal/ac)
Untreated Control
Treatments vs Untreated Control