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Grain Sorghum Performance Trials in Oklahoma, 2016

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Trial Objectives and Procedures

Each year performance trials for hybrid grain sorghum are conducted by the Oklahoma Cooperative Extension Service. These trials provide information to producers, Extension educators, industry representatives and researchers for grain sorghum hybrids marketed in Oklahoma. Performance trials were conducted at six locations in 2016. Dryland trials were planted at Apache, Goodwell, Homestead, Keyes, Tipton and Tonkawa. One fully sprinkler-irrigated trial and one limited drip-irrigated trial were planted at Goodwell. Double-crop trials were not planted in 2016. Yields are reported here for the full-maturity hybrids at Apache, for all maturity groups in the Goodwell dryland trial and the medium and full-season hybrids in the Goodwell sprinkler-irrigated trial, as well as for the full-maturity hybrids in the Goodwell fully-irrigated trial and the Homestead trials, the early and medium-maturity hybrids in the Keyes trial and the early and full-maturity hybrids at Tipton. The Tonkawa trial suffered from excessive early rains, giving such variable plant populations that the trial was discontinued mid-season. All other trials were harvested, but when yields were highly variable they were not reported. Table 1 lists the hybrids entered in the performance trial. Tables 2 through 13 report hybrid yields and test weights for the trials listed above. Table 14 compares yields of the sugarcane aphid tolerant hybrids across the different locations and conditions. The values in Table 14 are expressed as a percentage of the average value of the given location and maturity class. Table 15 gives the average yield statistics of all trials in 2017.

Grain sorghum hybrids entered (Table 1) were assigned by companies to their respective maturity groups (early-less than 60 days to mid-bloom, medium-60 to 69 days to mid-bloom, and late-70 days and greater to mid-bloom) and trial locations; therefore all hybrids were not entered at all locations. Companies designated all hybrid characteristics presented in Table 1. This information was not determined or verified

Highlights

Because of timely rains and light sugarcane aphid pressure, the Tipton trial produced the best yields in 2017, followed by the Goodwell dryland trial. Both locations had hybrids yielding well over 100 bushels. In the Panhandle, Keyes and Goodwell trials below-normal rains were received during the May, but above-average rainfall in June through August, and out-yielded the irrigated trials at Goodwell.

Sugarcane aphids reached treatment thresholds later than typical in 2016. Aphid infestations were heavy and sporadic in the sorghum belt of Oklahoma. Apache, Tipton and the irrigated trials at Goodwell developed infestations of sugarcane aphids, and all but Tipton were treated.

by Oklahoma State University. Company participation was voluntary and some hybrids marketed in Oklahoma were not included in the trials.

In 2016, 52 hybrids were entered by 10 seed companies (Table 1). Forty-three were entered in all trial locations, seven were entered in the Panhandle trials only and two were entered in the irrigated trials only. Among the varieties, twenty were entered as 'sugarcane aphid tolerant.' Ten of these appear on either the Sorghum Check-off or Louisiana State University lists of tolerant hybrids. A separate table appears at the end of this report (Table 14), listing comparative yields.

Each maturity group was tested in a randomized complete block design with four replications, except that in the medium maturity groups at Keyes and dryland trial at Goodwell there were three replications. Plots were two 30-inch rows by 25 feet for the body of the state and the irrigated and drip-irrigated trials. Plots were trimmed to 20 feet prior to harvest. The dryland trial at Goodwell was two 30-inch rows by 35 feet. Tractor-powered cone planters were used to plant all trials with

seeding rates adjusted for trial location. Trials were harvested with a Kincaid model, 8XP plot combine.

Target populations, cooperating producers, fertilization, cultural practices, soil series, herbicides and insecticides used in all trials are listed individually in the results tables. Rainfall data from the nearest Mesonet sites are also listed. Some trials are long distances from the nearest Mesonet site; therefore rainfall could be greater or less than reported.

Growing Conditions

Because of timely rains and light sugarcane aphid pressure, the Tipton trial produced the best yields in 2016, followed by the Goodwell dryland trial. Both locations had hybrids yielding well over 100 bushels. The Apache and Homestead trials suffered in 2016 from drought. Neither received appreciable rainfall in July. The Apache trial also developed a sugarcane aphid infestation and was treated once.

The Goodwell trial received four inches of rain in June, and was well ahead of average rainfall for the growing period. Keyes also received above average rains and produced good yields, but may have been delayed by low rainfall in May and dry topsoil at germination. The Keyes and Goodwell trials received below-normal rains during the May, but above-average rainfall in June through August, and out-yielded the irrigated trials at Goodwell.

Sugarcane aphids reached treatment thresholds later in 2016 than in previous years, and aphid infestations were sporadic in the sorghum belt of Oklahoma. Trials at Apache, Tipton and the irrigated trials at Goodwell developed infestations of sugarcane aphids. The Apache trial was sprayed once, and the Goodwell irrigated trials were sprayed twice. The Tipton trial was harvested rather than treated.

Among the varieties listed by universities, industry organizations and companies as sugarcane aphid-tolerant, DKS 37-03 exceeded average trial yields (see Table 15) as it has in previous years. Four hybrids: DKS 37-07, SP 73B12, W-844E and CHR 0072 exceeded average yields by 10 percent or more. Thirteen of these hybrids exceeded the yield averages for their respective location and maturity group.

Results

Grain yields are reported in bushels per acre of threshed grain, adjusted to a moisture content of 14.0 percent (Tables 2 through 1). Test weight is also reported in pounds per bushel. In some locations two year averages of grain yields and test weights are reported, as well as harvest moisture of grain. Bird damage and lodging are reported when present at a location. Different plant populations at each location prevent accurate

comparison between locations. Also, comparisons across maturity groups were not conducted. Producers should note that late-maturing hybrids will generally yield more than early and medium maturity hybrids. The availability of moisture at critical crop development periods, however, often influences yield more than the yield differences associated with maturity groups. When choosing a maturity group, the type of cropping system, planting date, planting rate and potential moisture should be taken into consideration. For more information consult Fact Sheet PSS-2034, *Grain Sorghum Planting Rates and Dates*, and Fact Sheet PSS-2113 *Grain Sorghum Production Calendar*.

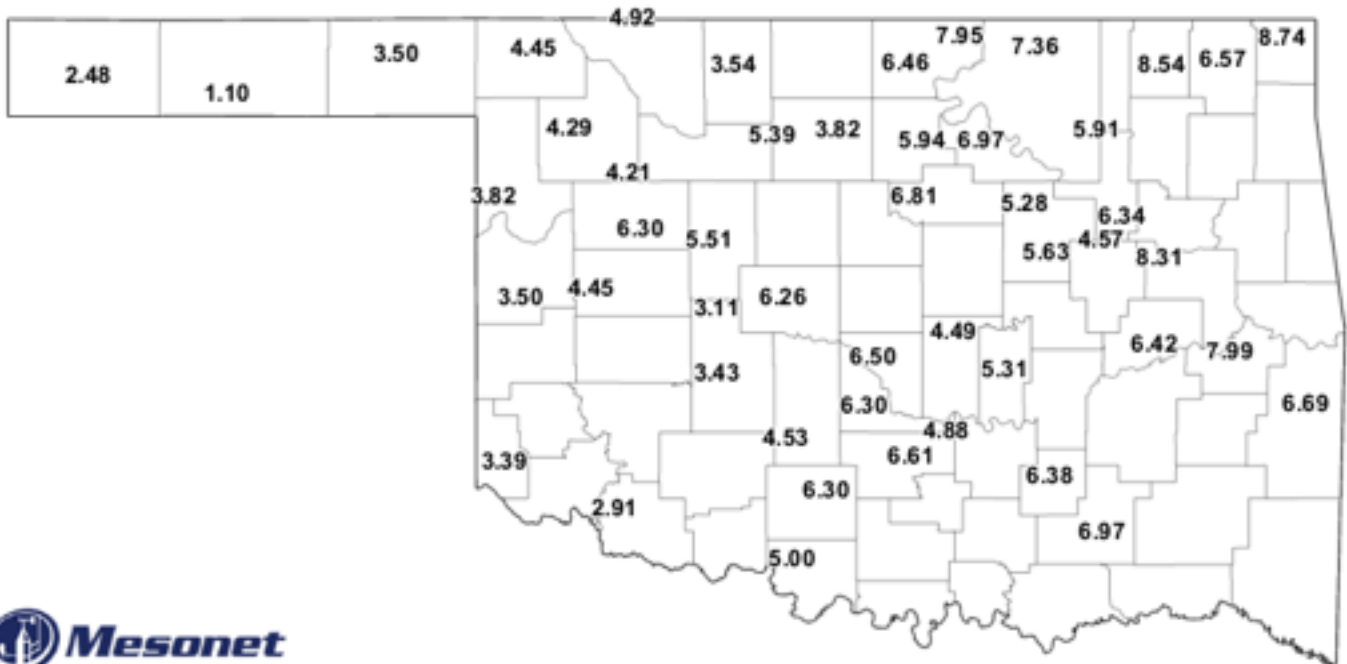
Least Significant Difference (L.S.D.) is a statistical test of yield differences and is shown at the bottom of each table. Unless two hybrids differ by at least the L.S.D shown, little confidence can be placed in one hybrid being superior to another and the difference is probably not real.

The Coefficient of Variation (C.V.) is provided as an estimate of the precision of the data with respect to the mean for that location and maturity group. To provide some indication of yield stability, multiple-year means for yield and test weight are provided where trials have been conducted for more than one year with more than three entries per maturity group. Producers interested in comparing hybrids for consistency of yield in a specific area should consult these entries.

Variability of yields within hybrids was higher than desirable the 2016 season. Some of this variability came from drought and insect pressure. Plant populations were also lower and less uniform than usual, which may have contributed to the problem. Models with CV's above 20 are not always reported, depending on location situations. However, when used, it should be with the understanding that a higher-than-desirable degree of variability existed around sample means. Models with CV's through 25 have been included in this report.

Acknowledgements

The financial support of the Oklahoma Sorghum Commission is gratefully acknowledged, as well as the efforts of the producer-cooperators: Alan Mindemann, Brook Strader, Kenneth Rose and Marty Williams. The authors are also grateful for research support from Jen Leach-Hamilton, Cameron Murley, Skeate Beck and Jeremy Brian of OPREC; and Rocky Thacker, Toby Kelley, Chase Harris and Jerry Goodson of SWREC. We also grateful for the help of County Agricultural Educators: Aaron Henson (Tillman County), Chad Webb (Noble County), and David Nowlin (Caddo County) who gave generously of their time to this project in 2016.

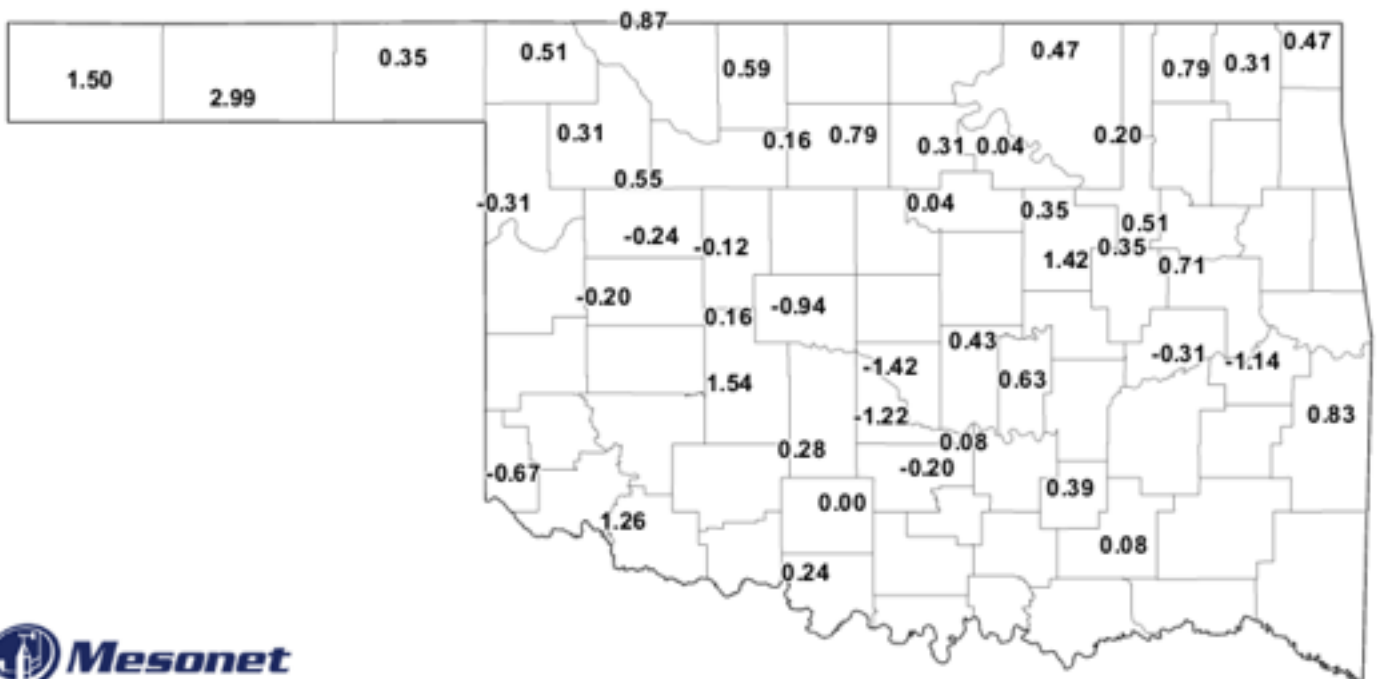


Average Plant Available Water in Top 32 inches

April 2001-2015

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Figure 1. Fifteen-year average inches of plant-available water in soil to 32 inches of depth for Oklahoma in April 2016.



Average Plant Available Water in Top 32 inches

Departure from Average, April 2016

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Figure 2. Departure from average for plant-available water in soil to 32 inches of depth for Oklahoma in April 2016.

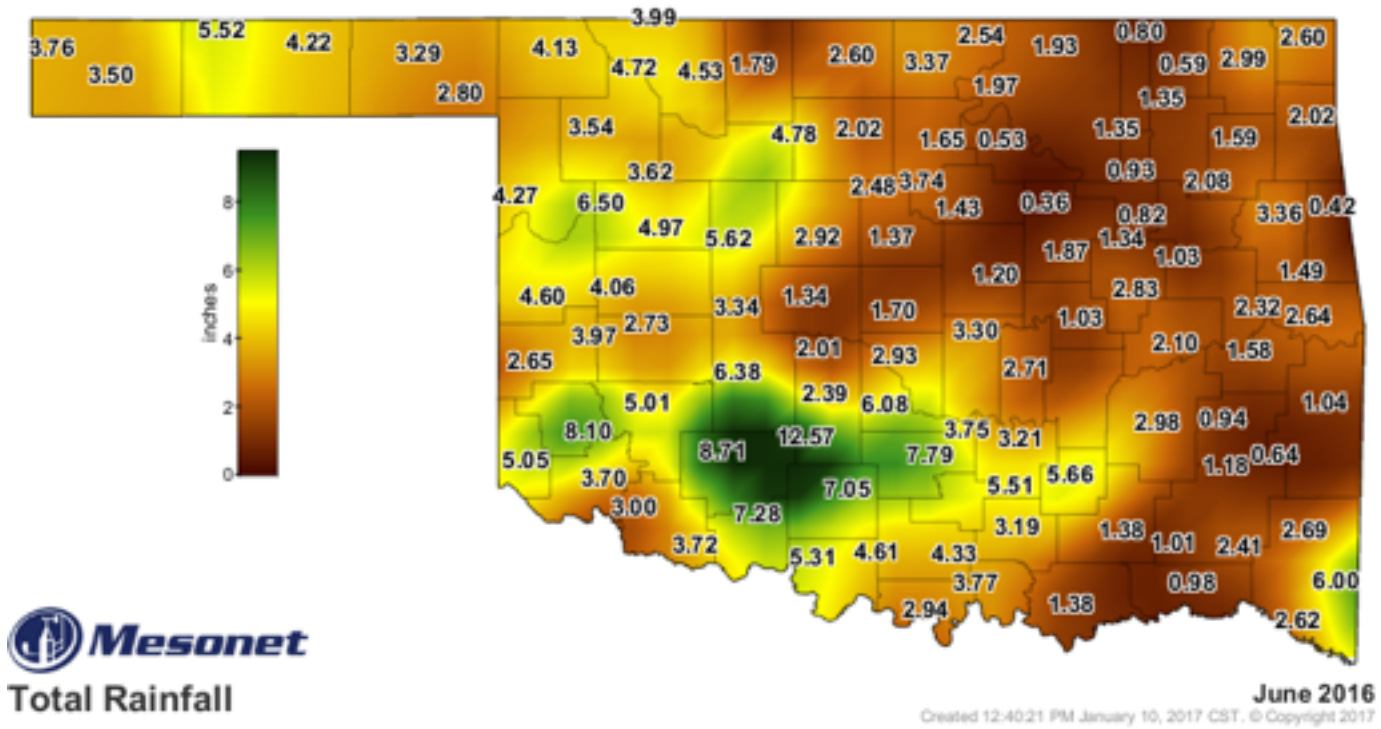


Figure 3. Total rainfall for Oklahoma in June 2016

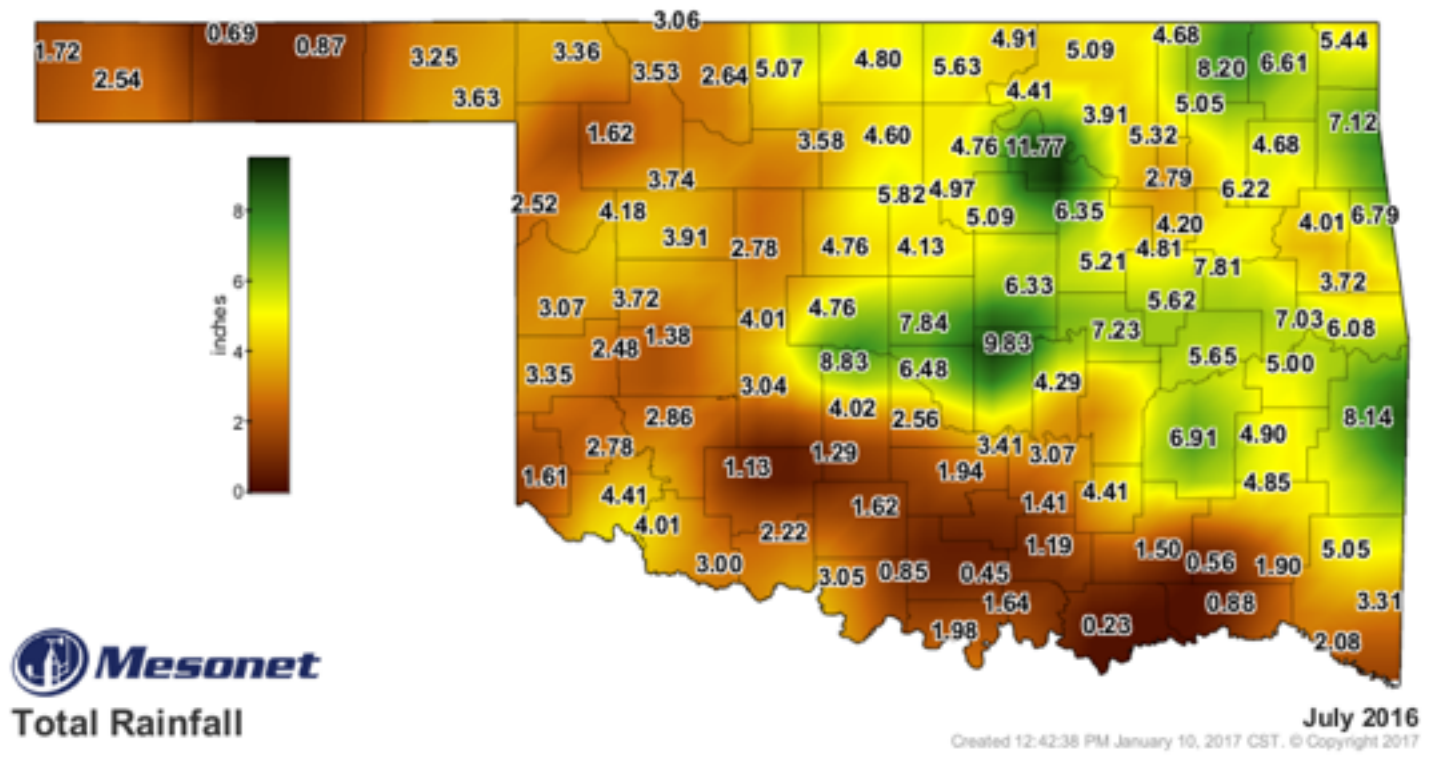


Figure 4. Total rainfall for Oklahoma in July 2016.

Table 1. Seed source and hybrid characteristics of grain sorghums in the Oklahoma Grain Sorghum Performance Trials, 2016. All hybrids are susceptible to birds and are single cross.

<i>Company Brand Name</i>	<i>Hybrid</i>	<i>Seed Color¹</i>	<i>Days to Mid-bloom</i>	<i>Sugarcane Aphid Tolerance²</i>	<i>Greenbug Resistance³</i>	<i>Trial Location⁴</i>
Richardson Seeds Ltd.	Swift	R	50-52	1,2	----	2
Sorghum Partners	SP 31A15	Bz	54-58	----	----	1
Chromatin, Inc.	CHR 0163	Bz	55-59	----	----	1
Johnston Seed Co.	JSG-55DC	Bz	55	----	C,E	1
Monsanto/DeKalb	DKS 28-05	Bz	58	----	----	1
Richardson Seeds Ltd.	Sprint	W	59-60	1,2	C,E	2
Monsanto/DeKalb	DKS 38-16	Bz	63	----	----	1
Monsanto/DeKalb	DKS 37-07	Bz	62	1,2	E	1
Monsanto/DeKalb	DKS 48-07	Bz	68	3	----	1
Scott Seed Co.	505x5	R	63	----	----	2
Scott Seed Co.	543x46	R	68	----	----	2
Heartland Genetics	HG 45-C	C	66	----	C,E,I	1
Heartland Genetics	HG 48-B	Bz	66	----	C,E	1
Richardson Seeds Ltd.	RS260E	R	64-65	1,2	C,E	2
Richardson Seeds Ltd.	RS215	R	62-63	----	C,E	2
Warner Seeds, Inc.	W-844E	R	65-70	1,2	C,E	1
NuTech Seed, LLC	EX663	Bz	66	----	C,E	1
NuTech Seed, LLC	EX626	Bz	62	3	C,E	1
NuTech Seed, LLC	EX676	R	67	----	C,E	1
NuTech Seed, LLC	GS623	R	62	----	C,E	1
NuTech Seed, LLC	GS693	R	69	----	C,E	1
Hoegemeyer Hybrids, Inc.	H6020	R	62	----	----	1
Hoegemeyer Hybrids, Inc.	H6037	R	63	----	----	1
Hoegemeyer Hybrids, Inc.	H6064	Bz	62	----	----	1
Hoegemeyer Hybrids, Inc.	H6098	R	69	----	----	1
Sorghum Partners	KS 585	Bz	64-68	----	C, E	1
Sorghum Partners	SP 34A19	Bz	57-61	----	----	1
Sorghum Partners	SP 68M57	Bz	64-68	3, MT	----	1
Johnston Seed Co.	JSG-65	Bz	65	----	C,E	1
Alta Seeds	AG 2115	R	64-69	----	----	1
Alta Seeds	AG1203	Bz	64-67	1,2	----	1
Alta Seeds	AG 1201	Bz	60	1,2	----	1
Alta Seeds	AG 3101	R	67-70	----	----	1
Alta Seeds	AG 2105	R	67	----	----	1
Alta Seeds	AG 3201	Bz	68	----	----	1
Alta Seeds	AG 1301	Cr	63	1,2	----	1
Alta Seeds	AG 2103	R	66	----	----	4
Alta Seeds	XG 2117	R	68	----	----	1
Alta Seeds	XG 2118	R	68	----	----	1
Scott Seed Co.	504x15	R	70	----	C,E	2
Monsanto/DeKalb	DKS 51-01	Bz	71	----	E	1
Monsanto/DeKalb	DKS 53-53	Bz	71	----	I	4
Warner Seeds, Inc.	W-7051	R	70-73	2	C,E	1
Chromatin, Inc	CHR 0072	Bz-	68-72	3, MT	----	1
Chromatin, Inc	CHR 0073	Bz	70-74	3, MT	----	1
Chromatin, Inc	CHR 0070	Bz	70-74	3, MT	----	1
Chromatin, Inc	CHR 0029	Bz	69-73	3, HT	----	1
Sorghum Partners	SP 73B12	Bz	68-72	2,3, HT	----	1
Sorghum Partners	NK 7633	Bz	70-74	3, MT	C	1
Sorghum Partners	K73 J6	Bz	69-73	3, MT	----	1
Heartland Genetics	HG 52-B	Bz	73	----	C,E	1
NuTech Seed, LLC	GS 725	R	71	3	C,E	1

¹ Seed Color: Br – Brown; W – White; Y – Yellow; Bz – Bronze; R – Red; C – Cream

² Sugarcane Aphid Tolerance: ---- not known to be SCA-tolerant; 1=Listed by LSU; 2=Listed by National Sorghum Check-off, 3=Listed by parent company; MT = moderately tolerant; HT = highly tolerant

³ Greenbug Resistance: Biotype hybrid

⁴ Trial locations: 1 – all; 2 – panhandle only; 3 – Apache, Homestead, Tipton, Tonkawa; 4 – irrigated only (OPREC)

Table 2. Results from Apache grain sorghum performance trial, 2016.

<i>Company Brand Name</i>	<i>Hybrid</i>	<i>Grain Yield (bu/ac)</i>	<i>Test weight (lb/bu)</i>	<i>Lodging %</i>	<i>Heads/acre</i>
<i>Full, 70 days or greater to mid-bloom</i>					
Chromatin, Inc.	CHR 0070	63	53	15	22,866
Sorghum Partners	NK 7633	60	53	5	22,213
Chromatin, Inc.	CHR 0072	57	51	10	25,915
Sorghum Partners	K73 J6	52	50	15	19,273
Monsanto	DKS 51-01	51	54	10	13,284
Heartland Genetics	HG 52B	50	51	5	20,797
Sorghum Partners	SP 73B12	48	53	0	15,026
NuTech Seed, LLC	GS 725	48	55	20	15,462
Chromatin, Inc.	CHR 0073	45	51	20	13,211
Warner Seeds, Inc.	W-7051	44	54	10	18,946
Chromatin, Inc.	CHR 0029	38	53	40	17,857
Mean		50	52.5	13.6	18,924
CV %		22.2	4.0		
L.S.D.		NS	NS		

Cooperator: Alan Mindemann

No-till broken out of Bermuda pasture in 2013
 Fertilizer: N: 118 lbs/ac P: 0 K: 0
 5 gallons of 10-34-0 applied at planting
 Herbicide: 2.7 qt/ac Lumax EZ + 1 qt glyphosate/ac
 Planting Date: May 6, 2016

Soil Series: Grant Loam
 Soil Test: N: 53 lbs./ac P: 172 lbs./ac K: 495 lbs./ac
 pH: 5.9
 Seeding rate: 56,000 seeds/ac
 Target population: 45,000 plants/ac
 Harvest Date: September 7, 2016

Monthly Rainfall (in.)	Apr.	May	June	July	Aug	Total
2016:	7.86	3.35	9.46	0.92	2.16	23.75
Long term mean:	3.49	4.46	4.56	2.44	2.68	17.63

Early and medium-season varieties were also tested at this location, but CV values prevent confident comparisons between hybrids (average yields and CV values are listed in Table 14).

Table 3. Results from Goodwell dryland grain sorghum performance trial, 2016.

<i>Company Brand Name</i>	<i>Hybrid</i>	<i>Grain Yield (bu/ac)</i>	<i>Test weight (lb/bu)</i>	<i>Population (plants/acre)</i>	<i>Heads/plant</i>
<i>Early maturity, less than 60 days to mid-bloom</i>					
Monsanto	DKS 37-07	127*	59	21,780	1.7
Monsanto	DKS 28-05	114	55	20,473	1.9
Sorghum Partners	SP 31A15	107	53	20,909	1.5
Johnston Seed Co.	JSG550C	104	56	20,415	1.6
Richardson Seed Ltd.	Swift	89	54	17,656	2.1
Richardson Seed Ltd.	Sprint WF	81	58	17,656	1.6
Chromatin, Inc	CHR 0163	56	58	3,282	3.5
Mean		97	56	17,424	2.0
CV %		22	3.3		
L.S.D.		31	2.7		

*Values in bold print are not statistically different from the highest value.

Table 4. Results from Goodwell dryland grain sorghum performance trial, 2016.

<i>Company Brand Name</i>	<i>Hybrid</i>	<i>Grain Yield (bu/ac)</i>	<i>Test weight (lb/bu)</i>	<i>Population (plants/acre)</i>	<i>Heads/plant</i>	<i>Lodging %</i>
<i>Full maturity, 70 days or more to mid-bloom</i>						
Chromatin, Inc.	CHR 0073	112	57	16,045	2.1	0
Chromatin, Inc.	CHR 0029	101	57	17,521	1.8	0
Sorghum Partners	SP 73B12	99	55	19,021	1.7	0
Scott Seed Co.	504x15	96	54	20,038	1.2	30
Sorghum Partners	K73 J6	96	56	19,747	1.8	0
Chromatin, Inc.	CHR 0070	93	57	19,844	1.6	0
Chromatin, Inc.	NK 7633	92	56	19,263	1.9	0
Heartland Genetics	HG 52B	88	57	20,425	1.8	15
Monsanto	DKS 51-01	85	56	19,747	1.9	0
Chromatin, Inc.	CHR 0072	85	54	19,360	1.6	0
NuTech Seed, LLC	GS 725	79	56	22,143	1.0	35
Warner Seeds, Inc.	W-7051	75	57	17,932	1.6	0
Mean		92	56	19,257	1.7	6.7
CV %		22	4.8			
L.S.D.		NS	NS			

Cooperator: OPREC

No-till following wheat

Herbicide: April: Cinch ATZ Lite (1 lb/ac)+ 1qt/ac Roundup

+3oz/ac Huskie (pre-emergence) June: 1pt/ac Huskie

Fertilizer: 0 NPK applied preplant (5 gal/ac 10-34-0 at planting)

Planting Date: June 10, 2015

Soil Series: Gruver Clay Loam (formerly Richfield)

Soil Test: N: 162

Seeding rate 31,000 seeds/ac

Target Population: 25,000 plants/ac

Harvest Date: October 25, 2016

Monthly Rainfall (in.)	Apr.	May	June	July	Aug	Total
2016:	3.84	1.19	4.17	1.73	3.27	14.2
Long-term mean:	1.46	2.24	2.57	2.39	2.36	11.0

Table 5. Results from Goodwell dryland grain sorghum performance trial, 2016.

<i>Company Brand Name</i>	<i>Hybrid</i>	<i>Grain Yield (bu/ac)</i>	<i>Test weight (lb/bu)</i>	<i>Population (plants/acre)</i>	<i>Heads/plant</i>	<i>Lodging %</i>
<i>Medium maturity, 60 to 69 days to mid-bloom</i>						
Monsanto	DKS 38-16	106	58	16,843	2.0	0
Alta Seeds	XG2118	105	57	19,070	1.5	0
Alta Seeds	XG2117	104	57	18,876	1.9	0
Monsanto	DKS 48-07	102	58	21,490	1.4	13
Warner Seeds, Inc.	W844E	100	57	19,650	1.2	20
Scott Seed Co.	505X5	92	58	17,908	1.7	0
Alta Seeds	AG 1301	91	56	19,747	1.5	7
Sorghum Partners	SP34A19	91	54	18,586	1.6	0
Heartland Genetics	HG 45-C	90	55	16,456	1.7	0
Heartland Genetics	HG 48-B	89	57	19,844	1.8	0
NuTech Seed, LLC	GS 693	88	59	18,198	1.4	20
NuTech Seed, LLC	GS 663	85	56	17,860	1.5	10
Johnston Seed Co.	JSG65	84	58	18,295	1.8	0
Scott Seed Co.	543X46	84	59	15,488	1.5	27
NuTech Seed, LLC	GS 623	84	58	18,586	1.6	0
Richardson Seeds Ltd.	RS260E	83	58	18,779	1.6	0
Hoegemeyer Hybrids, Inc.	H6020	82	57	19,554	1.8	20
Hoegemeyer Hybrids, Inc.	H6098	81	58	18,586	1.7	30
Hoegemeyer Hybrids, Inc.	H6064	80	56	20,038	1.5	0
Alta Seeds	AG 2105	79	57	20,038	1.5	20
NuTech Seed, LLC	EX676	78	56	13,649	2.4	0
NuTech Seed, LLC	EX626	78	56	19,650	1.1	60
Richardson Seeds Ltd.	RS215	77	57	13,649	2.0	0
Sorghum Partners	SP68M57	74	58	20,328	1.5	0
Sorghum Partners	KS 585	72	59	17,714	2.1	20
Alta Seeds	AG 1203	72	58	20,038	0.9	33
Alta Seeds	AG 2115	71	57	19,941	1.5	0
Hoegemeyer Hybrids, Inc.	H6037	69	56	18,198	2.0	0
Alta Seeds	AG 1201	65	55	20,425	1.2	27
Mean		84.7	57.1	18,528	1.6	11
CV %		22.2	2.9			
L.S.D.		NS	NS			

Table 6. Results from Goodwell drip-irrigated grain sorghum performance trial, 2016.

<i>Company Brand Name</i>	<i>Hybrid</i>	<i>Grain Yield (bu/ac)</i>	<i>Test weight (lb/bu)</i>	<i>Population (plants/acre)</i>	<i>Heads/plant</i>	<i>Bird Damage %</i>
<i>Medium maturity, 60 to 69 days to mid-bloom</i>						
Scott Seed Co.	505x5	92*	57	14,288	2.2	30
Warner Seeds, Inc.	W-844E	86	58	19,515	1.9	0
Alta Seeds	AG 1301	81	59	17,424	1.9	5
NuTech Seed, LLC	GS 623	80	60	17,250	2.4	30
Richardson Seeds Ltd.	RS215	80	59	13,329	2.4	5
Monsanto	DKS 48-07	79	58	22,041	1.5	10
Hoegemeyer Hybrids, Inc.	H6037	79	59	19,689	2.2	10
NuTech Seed, LLC	EX626	77	59	19,079	1.8	25
Heartland Genetics	HG 48-B	77	59	16,117	2.7	15
Alta Seeds	AG 2105	76	60	15,943	2.2	40
Alta Seeds	XG2117	75	59	17,598	2.2	15
Alta Seeds	XG2118	74	54	17,598	1.8	30
Monsanto	DKS 38-16	73	59	16,814	2.2	15
NuTech Seed, LLC	GS 693	73	57	17,772	2.1	20
Sorghum Partners	SP68M57	72	58	20,386	1.8	30
Scott Seed Co.	543X46	72	57	14,898	2.2	45
Hoegemeyer Hybrids, Inc.	H6064	71	59	15,246	2.6	25
Sorghum Partners	SP34A19	66	57	16,117	2.2	5
Richardson Seeds Ltd.	RS260E	65	59	16,814	2.2	40
Heartland Genetics	HG 45-C	63	59	16,988	2.0	15
NuTech Seed, LLC	GS 663	63	60	10,890	2.6	40
Hoegemeyer Hybrids, Inc.	H6020	63	57	15,333	2.1	25
NuTech Seed, LLC	EX676	62	58	16,640	2.1	25
Sorghum Partners	KS 585	60	58	17,772	2.3	5
Alta Seeds	AG 2115	59	57	20,125	1.7	25
Alta Seeds	AG 1203	58	59	14,636	2.7	20
Alta Seeds	AG 1201	56	58	17,337	1.8	10
Johnston Seed Co.	JSG65	50	58	16,814	2.3	10
Heartland Genetics	H6098	43	46	17,685	1.7	25
Mean		69.4	57.8	16,970	2.1	20.5
CV %		25.3	8.2			
L.S.D.		25.2	NS			

*Values in bold print are not statistically different from the highest value.

Table 7. Results from Goodwell drip-irrigated grain sorghum performance trial, 2016.

<i>Company Brand Name</i>	<i>Hybrid</i>	<i>Grain Yield (bu/ac)</i>	<i>Test weight (lb/bu)</i>	<i>Population (plants/acre)</i>	<i>Heads/plant</i>	<i>Bird Damage %</i>
<i>Full maturity, 70 days or more to mid-bloom</i>						
Monsanto	DKS 51-01	83	59	16,727	2.5	25
Sorghum Partners	SP 73B12	80	58	20,996	1.7	20
Sorghum Partners	K73 J6	79	57	19,950	2.1	30
Chromatin, Inc.	CHR 0072	77	59	19,079	1.8	25
Chromatin, Inc.	NK 7633	75	57	19689	2.0	10
Chromatin, Inc.	CHR 0070	74	59	16,640	2.1	20
Heartland Genetics	HG 52B	73	59	13,852	2.4	35
Scott Seed Co.	504x15	69	58	14,055	2.1	20
Chromatin, Inc.	CHR 0029	66	57	19,515	1.7	35
Chromatin, Inc.	CHR 0073	63	58	12,284	2.5	15
Warner Seeds, Inc.	W-7051	63	58	17,250	1.9	5
NuTech Seed, LLC	GS 725	51	60	18,818	1.4	20
Mean		70.9	58.3	17,405	2.0	22
CV %		24.0	4.5			
L.S.D.		NS	NS			

<p>Cooperator -- OPREC No-till following corn Herbicide: April: Cinch ATZ Lite (1 lb/ac) + 1qt/ac Roundup+3oz/ac Huskie June: 1pt/ac Huskie</p> <p>Insecticide: Aug. 24th: Sivanto + LI700 Seeding rate 48,000 seeds/ac Planting Date: June 10, 2016</p>	<p>Soil Series: Gruver Clay Loam (formerly Richfield) Soil Test: --- Fertilizer: 5 gal/ac 10-34-0 at planting. N applied through drip system-- 30lbs at planting, after V6: 30 lbs per week to a total of 180 lbs/acre. Sept. 23rd: Transform + Warrior Target Population: 38,000 plants/ac Harvest Date: November 1, 2016</p>
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Monthly Rainfall (in.) -- OPREC	Apr.	May	June	July	Aug	Total
2016 rainfall:	3.84	1.19	4.17	1.73	3.27	14.2
Drip irrigation:						10.0
Long-term mean:	1.46	2.24	2.57	2.39	2.36	11.0

Early-season varieties were also tested at this location, but CV values prevent confident comparisons between hybrids (average yields and CV values are listed in Table 14).

Table 8. Results from Goodwell fully-irrigated grain sorghum performance trial, 2016.

<i>Company Brand Name</i>	<i>Hybrid</i>	<i>Grain Yield (bu/ac)</i>	<i>Test weight (lb/bu)</i>	<i>Population</i>	<i>Heads/plant</i>	<i>Lodging %</i>	<i>Sugarcane Aphid Rating*</i>
<i>Full maturity, 70 days or more to mid-bloom</i>							
Monsanto	DKS 51-01	90	54	27,094	1.6	0	1.4
Chromatin, Inc.	CHR 0070	87	51	25,788	1.5	0	1.6
NuTech Seed, LLC	GS 725	84	61	27,443	1.3	20	1.6
Chromatin, Inc.	NK 7633	76	58	29,969	1.4	0	1.3
Monsanto	DKS 53-03	76	57	28,401	1.4	0	2.2
Heartland Genetics	HG 52B	75	59	27,443	1.5	0	1.4
Sorghum Partners	K73 J6	74	58	25,613	1.7	0	1.6
Scott Seed Co.	504x15	73	58	29,011	1.3	10	1.3
Chromatin, Inc.	CHR 0029	72	56	27,094	1.3	0	1.4
Sorghum Partners	SP 73B12	66	52	27,007	1.5	5	1.5
Chromatin, Inc.	CHR 0072	65	58	27,007	1.5	0	1.8
Chromatin, Inc.	CHR 0073	61	57	18,905	2.0	0	1.5
Warner Seeds, Inc.	W-7051	58	45	21,170	1.7	0	1.5
Mean		72.9	55.5	26,304	1.5	2.7	1.5
CV %		19.1	12.3				
L.S.D.		NS	NS				

* Based on a scale of 0-5, indicating presence and damage, where 0=no damage and 5=severe infestation and damage, average of 4 values.

Cooperator -- OPREC
 No-till following sunflowers
 Herbicide: April: Cinch ATZ Lite (1 lb/ac)+ 1qt/ac
 Roundup+3oz/ac Huskie June: 1pt Huskie
 Seeding rate 64,500 seeds/ac
 Planting Date: June 9, 2015

Soil Series: Gruver Clay Loam (formerly Richfield)
 Fertilizer: soil test + fertilizer N:250, P:65 + 5 gal/ac
 10-34-0 with planter
 Target Population: 50,000 plants/ac
 Harvest Date: October 26, 2016

Monthly Rainfall (in.) -- OPREC	Apr.	May	June	July	Aug	Total
2016 rainfall:	3.84	1.19	4.17	1.73	3.27	14.2
Irrigation:						10.0
Long-term mean:	1.46	2.24	2.57	2.39	2.36	11.0

Early and medium-season varieties were also tested at this location, but CV values prevent confident comparisons between hybrids (average yields and CV values are listed in Table 14).

Table 9. Results from Homestead fully-irrigated grain sorghum performance trial, 2016.

<i>Company Brand Name</i>	<i>Hybrid</i>	<i>Grain Yield (bu/ac)</i>	<i>Test weight (lb/bu)</i>	<i>Heads/acre</i>	<i>Lodging %</i>	<i>Bird Damage %</i>	<i>Poor Pollination %</i>
<i>Full maturity, 70 days or more to mid-bloom</i>							
Monsanto	DKS 51-01	65	50	37,244	5	0	10
Sorghum Partners	K73 J6	58	50	36,482	0	5	5
Heartland Genetics	HG 52B	52	54	35,284	5	5	10
NuTech Seed, LLC	GS 725	50	55	33,977	25	0	5
Chromatin, Inc.	CHR 0072	49	52	34,082	5	0	10
Chromatin, Inc.	CHR 0029	47	53	34,739	0	20	0
Sorghum Partners	NK 7633	43	53	36,699	5	5	5
Chromatin, Inc.	CHR 0073	41	51	32,452	0	10	0
Warner Seeds, Inc.	W-7051	39	52	34,521	5	10	0
Chromatin, Inc.	CHR 0070	39	50	36,699	5	5	5
Sorghum Partners	SP 73B12	37	51	43,996	0	5	0
Mean		45.8	51.9	36,016	5.0	5.9	4.5
CV %		24.9	6.4				
L.S.D.		NS	NS				

Cooperator: Brook Strader

Conventional till

Soil Test: N: --- P: --- K: --- pH: 5.9

Herbicide: Atrazine4L 2 pt/ac plus

1.3 pt/ac dual (Preemergence)

Planting Date: April 28, 2016

Soil Series: Canadian Fine Sandy Loam

Fertilizer: N: 95 lb/ac + 5 gal/ac 10-34-0 with planter

Seeding rate: 56,000 seeds/ac

Target Population: 45,000 plants/ac

Harvest Date: Aug. 23, 2016

Monthly Rainfall (in.) --Homestead (Fairview)	Apr.	May	June	July	Aug	Total
2016:	5.77	2.0	nil	nil	3.00	10.77
Long-term mean:	3.36	3.57	4.16	2.81	2.70	16.60

Early and medium-season varieties were also tested at this location, but CV values prevent confident comparisons between hybrids (average yields and CV values are listed in Table 14).

Table 10. Results from Keyes dryland grain sorghum performance trial, 2016.

<i>Company Brand Name</i>	<i>Hybrid</i>	<i>Grain Yield (bu/ac)</i>	<i>Test weight (lb/bu)</i>	<i>Heads/ acre</i>	<i>Lodging %</i>	<i>Bird Damage %</i>	<i>Poor emergence %</i>
<i>Early maturity, less than 60 days to mid-bloom</i>							
Monsanto	DKS 28-05	80*	53	25,483	0	10	10
Monsanto	DKS 37-07	79	57	22,942	15	15	10
Chromatin, Inc.	SP 31A15	78	56	24,321	0	5	10
Richardson Seed Ltd.	Sprint WF	73	57	21,272	0	0	15
Johnston Seed Co.	JSG550C	67	56	17,860	0	0	20
Richardson Seed Ltd.	Swift	65	55	25,773	0	0	15
Chromatin, Inc	CHR 0163	37	56	7,986	0	0	15
Mean		68.5	56	20,792	2.1	4.3	13.6
CV %		21	4.5				
L.S.D.		21	NS				

*Values in bold print are not statistically different from the highest value.

Cooperator:

Kenneth Rose
 No-till following wheat in 2013
 Fertilizer: N: 130 lbs N/ac + 5 gal/ac 10-34-0 with planter
 Seeding rate 31,000 seeds/ac
 Planting Date: June 11, 2016

Soil Series: Sherm Clay Loam
 Soil Test: N: NA P: NA K: NA pH: NA
 Herbicide: Cinch ATZ Lite 2 qts/ac (Preemergence)
 Target Population: 25,000 plants/ac
 Harvest Date: October 27, 2016

Monthly Rainfall (in.)--Boise City	Apr.	May	June	July	Aug	Total	
2016:	6.62	0.88	3.50	2.54	4.87	18.41	
Long-term mean:	1.46	1.56	2.28	2.84	2.90	11.04	

Full-season varieties were also tested at this location, but CV values prevent confident comparisons between hybrids (average yields and CV values are listed in Table 14).

Table 11. Results from Keyes dryland grain sorghum performance trial, 2016.

<i>Company Brand Name</i>	<i>Hybrid</i>	<i>Grain Yield (bu/ac)</i>	<i>Test weight (lb/bu)</i>	<i>Heads/acre</i>	<i>Lodging %</i>	<i>Bird Damage %</i>
<i>Medium maturity, 60-69 days to mid-bloom</i>						
NuTech Seed, LLC	GS 693	92*	56	25,652	13	0
Heartland Genetics	HG-48B	90	55	30,105	0	13
Johnston Seed Co.	JSG65	86	56	24,878	0	13
Monsanto	DKS 38-16	85	57	24,781	0	13
Alta Seeds	XG2117	84	57	24,684	0	0
Hoegemeyer Hybrids, Inc.	H6020	83	57	26,717	0	0
Chromatin, Inc	SP68M57	82	57	25,362	0	40
Chromatin, Inc	SP34A19	80	55	22,264	6.7	0
Hoegemeyer Hybrids, Inc.	H6098	79	55	23,619	6.7	6.7
NuTech Seed, LLC	GS 663	78	57	17,424	13	6.7
Hoegemeyer Hybrids, Inc.	H6064	75	56	22,264	6.7	13
Alta Seeds	XG2118	74	58	20,425	6.7	0
Chromatin, Inc	KS 585	72	57	22,845	0	0
Monsanto	DKS 48-07	72	56	21,490	0	13
Alta Seeds	AG1203	72	56	19,941	0	20
NuTech Seed, LLC	GS 623	68	55	25,555	0	47
Alta Seeds	AG 1201	67	54	22,070	33	0
Heartland Genetics	HG 45C	66	51	20,715	0	13
Warner Seeds, Inc.	W 844E	66	53	19,747	20	0
Richardson Seeds Ltd.	RS215	65	56	16,843	0	6.7
Alta Seeds	AG 1301	64	56	21,199	0	0
NuTech Seed, LLC	EX626	64	52	22,458	0	6.7
Scott Seed Co.	505X5	63	56	21,393	0	0
Richardson Seeds Ltd.	RS 260E	60	55	16,843	0	0
Alta Seeds	AG 2115	58	56	15,391	0	13
NuTech Seed, LLC	EX 676	58	57	20,134	0	6.7
Scott Seed Co.	543X46	57	53	17,811	0	0
Hoegemeyer Hybrids, Inc.	H6037	57	51	19,554	0	6.7
Alta Seeds	AG 2105	54	55	15,004	13	0
Mean		72	55.2	21,606	4.1	8.3
CV %		15	3.9			
L.S.D.		17	3.5			

*Values in bold print are not statistically different from the highest value.

Table 12. Results from Tipton dryland grain sorghum performance trial, 2016.

Company Brand Name	Hybrid	Grain Yield (bu/ac)	Test weight (lb/bu)	Population (plants/acre)	Heads/plant	Lodging**
<i>Early maturity, less than 60 days to mid-bloom</i>						
Monsanto	DKS 37-07	108	55	19,602	3.5	0
Johnston Seed Co.	JSG55C	102	53	18,513	4.5	0
Monsanto	DKS 28-05	102	53	16,698	4.7	0
Chromatin, Inc.	SP31A15	101	52	21,054	3.9	0
Chromatin, Inc.	CHR 0163	67	54	6,171	5.4	0
Mean		96	53	16,407	4.4	0
CV %		11	3.4			
L.S.D.		16	2.8			

*Values in bold print are not statistically different from the highest value.

**Bird damage was light and fairly uniform.

Table 13. Results from Tipton dryland grain sorghum performance trial, 2016.

Company Brand Name	Hybrid	Grain Yield (bu/ac)	Test weight (lb/bu)	Population (plants/acre)	Heads/plant	Lodging**
<i>Full maturity, 70 days or more to mid-bloom</i>						
Chromatin, Inc.	CHR0072	119*	58	18,513	3.3	0
Chromatin, Inc.	CHR0070	119	59	17,787	3.3	0
Monsanto	DKS 51-01	116	58	19,602	3.4	0
Chromatin, Inc.	NK7633	109	59	18,876	3.3	0
Heartland Genetics	HG 52B	109	58	19,239	3.2	0
Chromatin, Inc.	K73-J6	106	58	17,424	3.5	0
NuTech Seed, LLC	GS 725	103	59	21,054	3.0	0
Chromatin, Inc.	SP73B12	100	57	17,061	3.8	0
Chromatin, Inc.	CHR0073	99	56	15,609	3.4	5
Chromatin, Inc.	CHR0029	99	56	14,157	5.3	0
Warner Seeds, Inc.	W-7051	87	58	17,061	2.6	5
Mean		106	57.9	17,853	3.5	0.9
CV %		9.2	1.4			
L.S.D.		14.2	1.2			

*Values in bold print are not statistically different from the highest value.

**Bird damage was light and fairly uniform.

Medium-season varieties were also tested at this location, but CV values prevent confident comparisons between hybrids (average yields and CV values are listed in Table 15).

Cooperator: Tipton Valley Research Center

Conventional Tillage Practices: Sorghum-fallow-sorghum rotation

Fertilizer: N: 132 lbs/ac P: 30 K: 0

+5 gallon 10-34-0 at planting

Herbicide: Cinch ATZ Lite 1.5 qts/ac (Preemergence)

Planting Date: April 25, 2016

Soil Series: Tipton Silt Loam

Soil Test: N: 12 lb/ac P: 56 lb/ac K: 648 lb/ac pH: 6.8

Seeding rate: 56,000 seeds/ac

Target population 45,000 plants/ac

Harvest Date: August 26, 2016

Monthly Rainfall (in.)	April	May	June	July	Aug	Total
2016	8.56	7.15	3.00	4.01	1.95	24.67
Long-term mean	2.82	3.38	3.29	2.38	2.03	13.90

Table 14. Percentage of the average yield of the location/maturity class; sugarcane aphid-tolerant varieties, 2016.

Variety	Maturity Class	SCA Tolerance ^a	Apache ^{b, c}	Goodwell Dryland	Goodwell Drip Irr. ^g	Goodwell Fully Irr. ^g	Homestead ^c	Keyes	Tipton ^h	Average
DKS 37-07	M	1,2	128 ^d	151	----	112	----	----	113	126 (4) ⁱ
SP 73B12	F	2,3 HT	96	108	113	90	----	169	94	112 (6)
W-844E	M	1,2	----	119	123	99	127	92	----	112 (5)
CHR 0072	F	3, MT	112	----	108	----	107	----	113	110 (4)
DKS 48-07	M	3	118	120	114	99	88	100	108	106 (7)
CHR 0070	F	3, MT	126	101	104	119	85	92	112	106 (7)
SP 68M57	M	3, MT	----	88	103	----	114	114	----	105 (4)
Sprint	E	1,2	NI ^f	----	----	103	NI	106	NI	105 (2)
AG 1301	M	1,2	----	107	116	----	----	89	----	104 (3)
EX 626	M	3	105	93	110	116	----	89	105	103 (6)
K73 J6	F	3, MT	102	104	111	101	----	99	100	103 (6)
NK 7633	F	3, MT	118	100	----	104	93	87	103	101 (6)
GS 725	F	3	120	86	----	115	109	81	97	101 (6)
CHR 0029	F	3, MT	74	110	----	99	100	103	93	99 (6)
AG 1201	M	1,2	----	----	----	89	----	93	99	94 (3)
CHR 0073	F	3, MT	90	122	----	82	----	77	93	93 (5)
AG 1203	M	1,2	----	----	----	83	----	100	----	92 (2)
RS260E	M	1,2	NI	98	----	----	NI	83	NI	91 (2)
W-7051	F	2	110	82	89	----	----	79	82	88 (5)
Swift	E	1,2	NI	92	82	86	NI	----	NI	87 (3)

^a Sugarcane Aphid Tolerance: 1=Listed by LSU; 2=Listed by National Sorghum Check-off, 3=Listed by parent company; MT = moderately tolerant; HT = highly tolerant

^b Heavy sugarcane aphid pressure, treated once

^c Mid-season drought

^d Expressed as percentage of the average yield of the site and maturity class.

^e ---- not reported due to high variability among the 4 yield values (CV>25).

^f NI: variety not included at this location

^g Heavy sugarcane aphid pressure, treated twice

^h Light sugarcane aphid pressure, not treated

ⁱ Number of values averaged

Table 15. Yield statistics from all trials, 2016.

Trial Location	Maturity Group	Average Grain Yield (bu/ac)	Range of Yields (bu/ac)	LSD	CV
Apache	Early	30	24-51	44	34
	Medium	40	17-56	19	32
	Full	50	38-63	16	22
Goodwell Dryland	Early	97	56-127	31	22
	Medium	84	65-105	30	22
	Full	92	75-112	38	22
Goodwell Drip Irrigation	Early	60	49-71	30	33
	Medium	70	43-92	25	25
	Full	71	51-83	26	24
Goodwell Full Irrigation	Early	71	39-91	29	27
	Medium	75	61-95	28	26
	Full	73	58-90	23	19
Homestead	Early	43	31-44	54	81
	Medium	49	32-70	28	40
	Full	46	36-65	17	25
Keyes	Early	69	37-80	22	22
	Medium	72	54-92	18	15
	Full	78	53-132	45	39
Tipton	Early	96	67-108	16	11
	Medium	96	51-123	63	47
	Full	106	87-120	14	9

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