

Final Report

Arizona Grain Research and Promotion Council

November, 2018

Small Grains Variety Testing, 2018

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Small Grains Variety Evaluation at Maricopa, Eloy, and Yuma 2018

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Summary

Small grain varieties are evaluated each year by University of Arizona personnel. The purpose of these tests is to characterize varieties in terms of yield and other attributes. Variety performance varies greatly from year to year and several site-years are necessary to adequately characterize the yield potential of a variety. A summary of small grain variety trials conducted by the University of Arizona can be found online at <http://ag.arizona.edu/pubs/crops/az1265-2016.pdf>.

Introduction

Small grain varieties were tested as part of the on-going effort to assess variety productivity and characteristics. Barley and durum commercial cultivars were tested. The purpose of these tests is to characterize varieties in terms of yield potential, quality, and other characteristics. Variety trials on agricultural experimental stations do not substitute for localized on-farm testing of new varieties. Varieties are known to differ in their response to specific management regimes and weather conditions. A summary of small grain variety trials conducted by the University of Arizona is available from your local Cooperative Extension office or online at <http://ag.arizona.edu/pubs/crops/az1265-2016.pdf>.

Procedure

Barley and durum varieties were evaluated at Maricopa by the University of Arizona (UA), at Eloy by Arizona Plant Breeders (APB), and Yuma by Second Nature Research (SNR). The seed was planted with a cone planter in plots 20 ft long in seven rows spaced 7 inches apart. The seeding rate was approximately 100 lbs/acre for durum and 85 lbs/acre for barley. The experimental design was a randomized complete block with 4 replications and 5 barley and 13-18 durum entries. Growing conditions are listed in Table 1.

The following data was collected: grain yield, test weight, seed weight, plant height, lodging, grain protein, HVAC (durum only), and heading date (Yuma only). Grain was harvested with a small plot combine and yields are expressed on an “as is” moisture basis. Test weight was calculated from the weight of 1 pint of grain. Seed weight was determined from 200 seed. HVAC was determined from 10 g of seed. Grain protein was determined from total N multiplied by 6.25 for barley and 5.7 for durum and expressed on a 12% moisture basis.

Discussion

Yield and plant characteristics of the varieties are presented in Tables 2-7. Several locations and years are needed to accurately assess variety performance. The results of this trial are most useful when combined with data from previous years. A summary of small grain variety trials conducted by the University of Arizona can be found online at <http://ag.arizona.edu/pubs/crops/az1265-2016.pdf>.

Acknowledgments

Financial support for this project was received from the Arizona Grain Research and Promotion Council and the Arizona Crop Improvement Association. The technical assistance of Mary Comeau is greatly appreciated.

Table 1. Template for cultural practices for the small grains variety trials at the various locations.

Cultural information	Yuma Regular Planting (SNR)	Somerton Late Planting (SNR)	Maricopa (UA)
Previous crop	Romaine Hearts	Romaine Hearts	Sudangrass
Soil texture	Gila Clay Loam	Gila Clay Loam	Sandy loam
Planting date	12/27/18	1/11/18	12/8/17
Irrigation dates (amount, inches)	12/27 sprinkler germ 2/25 flood 3/1 flood 3/20 flood 4/5 flood 4/20 flood 5/3 flood	1/11 sprinkle germ 2/16 flood 3/1 flood 3/20 flood 4/5 flood 4/20 flood 5/1 flood 5/15 flood	12/8 2/1 2/21 3/14 3/28 4/9 4/20
Nitrogen application dates: (lbs N/a and fertilizer)	2/5: 85 as 32-0-0 3/1: 60 as 32-0-0 3/20: 60 as 32-0-0 4/5: 42 as 32-0-0 4/20: 42 as 32-0-0 TOTAL = 284 lbs N/A	2/16: 85 as 32-0-0 3/1: 60 as 32-0-0 3/20: 60 as 32-0-0 4/5: 42 as 32-0-0 4/20: 42 as 32-0-0 TOTAL = 284 lbs N/A	12/8: 50 as 46-0-0 2/1: 75 as 21-0-0 2/21: 75 as 21-0-0 3/14: 50 as 46-0-0 3/28: 50 as 46-0-0 TOTAL = 300 lbs N/A
Pesticide (date)	Affinity/Aim 2/1	Affinity/Aim 2/22	None
Harvest date	6/12/18	6/19/18	5/23/18

Table 2. Barley and durum variety yield results from the UA at Maricopa Ag Center, 2018.

Entry	Source	Grain yield lb/acre	Test weight lb/bu	Seed weight mg	Plant height inches	Lodging %	HVAC %	Grain protein %
<u>Barley</u>								
Baretta	APB	6882	50.8	41.4	30	0	---	10.4
Kopious	APB	6519	48.9	36.5	26	0	---	10.1
Chico	HSG	7200	49.8	37.1	28	0	---	10.7
Cochise	HSG	6640	51.6	44.0	30	3	---	12.3
Nebula	HSG	7275	50.9	43.0	29	2	---	10.6
Avg	---	6903	50.4	40.4	29	1	---	10.8
CV (%)	12.3							
LSD _{.05}	1313							
<u>Durum</u>								
Alberto	APB	6700	61.0	47.8	28	0	99	13.2
Helios	APB	6837	62.2	46.9	34	0	98	12.8
Kronos	APB	6746	62.2	55.2	33	11	100	13.0
Tiburón	APB	7094	61.9	53.8	31	0	99	12.4
Westmore HP	APB	6837	63.8	41.4	33	2	100	13.2
Candura	Dunn	6504	61.9	39.2	37	0	98	12.7
DuraKing	Dunn	6897	62.8	42.4	34	0	100	12.0
Platinum	Dunn	6761	62.8	41.3	32	1	98	12.0
Topper	Dunn	6232	61.5	37.2	36	0	98	12.5
Orita	SNR	6292	59.4	42.9	34	0	99	13.3
Powell	SNR	7260	62.9	48.2	32	0	99	13.2
WB-Mead	SNR	5385	61.4	37.2	37	0	98	13.3
WB-Mohave	SNR	6171	63.1	49.8	36	0	100	12.8
Colombo	Allstar	4583	58.6	29.0	34	0	99	14.4
Maestrале	Allstar	6337	63.4	45.5	39	3	99	13.4
Saragolla	Allstar	6413	64.0	48.3	33	5	97	13.0
Desert King	UC	6504	59.8	41.4	36	0	100	13.5
Miwok	UC	6111	62.3	47.4	35	0	99	13.7
Avg	---	6426	61.9	44.2	34	1	99	13.0
CV (%)	8.9							
LSD _{.05}	808							

Abbreviations: APB = Arizona Plant Breeders, HSG = Highland Specialty Grains, SNR = Second Nature Research, UC = University of California

Table 3. Barley and durum variety yield results from APB in Eloy, 2018.

Entry	Source	Grain yield lb/acre	Test weight lb/bu	Seed weight mg	Lodging %	HVAC %	Grain protein %
<u>Barley</u>							
Baretta	APB	6756	48.3	45.6	63	---	12.6
Kopious	APB	6744	51.2	44.6	25	---	10.2
Chico	HSG	7158	48.6	38.1	28	---	11.3
Cochise	HSG	5569	49.6	39.3	68	---	13.1
Nebula	HSG	7668	43.6	44.2	70	---	11.3
Avg	---	6779	48.2	42.3	51	---	11.7
CV (%)	18.1						
LSD _{.05}	1893						
<u>Durum</u>							
Alberto	APB	9891	60.7	47.8	8	99	12.4
Helios	APB	7792	61.5	44.6	60	95	13.8
Kronos	APB	8173	60.4	53.8	60	100	13.7
Tiburón	APB	9918	59.4	50.0	30	99	13.1
Westmore HP	APB	6348	61.2	38.8	78	100	13.4
Candura	Dunn	9528	61.5	44.8	33	99	13.6
DuraKing	Dunn	10247	60.3	44.1	23	99	12.4
Platinum	Dunn	8826	58.4	41.6	68	99	12.3
Topper	Dunn	9824	60.5	46.4	18	99	13.1
Orita	SNR	10489	61.9	55.5	13	99	14.2
Powell	SNR	10934	62.3	51.7	10	100	13.5
WB-Mead	SNR	9365	61.8	48.6	35	100	13.9
WB-Mohave	SNR	9233	60.6	42.8	45	100	13.8
Avg	---	9274	60.8	47.0	37	99	13.3
CV (%)	8.4						
LSD _{.05}	1122						

Abbreviations: APB = Arizona Plant Breeders, HSG = Highland Specialty Grains, SNR = Second Nature Research, UC = University of California

Table 4. Durum variety yield results from SNR planted on 12/27 in Yuma, 2018.

Entry	Source	Grain yield lb/acre	Test weight lb/bu	Plant height inches	Lodging %	Heading date
Alberto	APB	7424	60.0	29	13	3/31
Helios	APB	6863	61.6	34	67	3/24
Kronos	APB	6767	59.9	33	73	3/26
Tiburon	APB	6612	60.2	32	47	4/01
Westmore HP	APB	5916	57.4	35	87	3/27
Candura	Dunn	7057	60.4	34	67	4/03
DuraKing	Dunn	7849	61.5	33	37	4/03
Platinum	Dunn	6728	60.7	31	50	4/03
Topper	Dunn	8004	62.3	34	20	4/03
Orita	SNR	7927	60.9	32	23	4/04
Powell	SNR	8487	62.8	32	33	3/30
WB-Mead	SNR	7501	60.6	32	27	4/07
WB-Mohave	SNR	6477	60.1	32	67	4/01
Desert King	UC	6457	56.3	32	57	4/04
Miwok	UC	7559	61.8	33	47	4/06
Avg	---	7175	60.4	32	48	4/01
CV (%)	8.5					
LSD _{.05}	1024					

Abbreviations: APB = Arizona Plant Breeders, HSG = Highland Specialty Grains, SNR = Second Nature Research, UC = University of California

Table 5. Durum variety yield results from SNR planted on 1/11 in Somerton, 2018.

Entry	Source	Grain yield lb/acre	Test weight lb/bu	Plant height inches
Alberto	APB	5227	60.4	27
Helios	APB	6204	61.2	31
Kronos	APB	5359	61.2	28
Tiburon	APB	5597	60.5	29
Westmore HP	APB	6415	60.5	29
Candura	Dunn	5465	61.6	31
DuraKing	Dunn	6494	62.4	29
Platinum	Dunn	5597	61.0	28
Topper	Dunn	6283	62.7	32
Orita	SNR	5465	59.5	33
Powell	SNR	5834	62.8	28
WB-Mead	SNR	5306	60.7	34
WB-Mohave	SNR	5570	62.1	29
Desert King	UC	4778	57.6	31
Miwok	UC	4911	61.7	32
Avg	---	5634	61.1	30
CV (%)	11.6			
LSD _{.05}	1093			

Abbreviations: APB = Arizona Plant Breeders, HSG = Highland Specialty Grains, SNR = Second Nature Research, UC = University of California

Table 6. Summary of barley and durum variety yield results for 2018 from four locations.

Entry	Source	Grain yield (% of location average)				Mean	Standard Deviation
		Eloy (APB)	Somerton (SNR)	Yuma (SNR)	Maricopa (UA)		
<u>Barley</u>							
Baretta	APB	100	---	---	100	100	0
Kopious	APB	99	---	---	94	97	4
Chico	HSG	106	---	---	104	105	1
Cochise	HSG	82	---	---	96	89	10
Nebula	HSG	113	---	---	105	109	5
<u>Durum</u>							
Alberto	APB	107	93	103	102	101	6
Helios	APB	84	110	96	104	99	11
Kronos	APB	88	95	94	103	95	6
Tiburon	APB	107	99	92	108	102	7
Westmore HP	APB	68	114	82	104	92	21
Candura	Dunn	103	97	98	99	99	2
DuraKing	Dunn	110	115	109	105	110	4
Platinum	Dunn	95	99	94	103	98	4
Topper	Dunn	106	112	112	95	106	8
Orita	SNR	113	97	110	96	104	9
Powell	SNR	118	104	118	111	113	7
WB-Mead	SNR	101	94	105	82	95	10
WB-Mohave	SNR	100	99	90	94	96	4
Desert King	UC	---	85	90	99	91	7
Miwok	UC	---	87	105	93	95	9