



# Research Report

## Small Grains Variety Evaluation at Casa Grande, Maricopa, and Yuma 2020

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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 <https://extension.arizona.edu/sites/extension.arizona.edu/files/pubs/az1265-2020.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.

### Procedure

Barley and durum varieties were evaluated at Casa Grande by Arizona Plant Breeders (APB), Maricopa by the University of Arizona (UA) 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 3-4 replications at each location. Growing conditions are listed in Table 1.

The following data was collected: grain yield, test weight, seed weight, plant height, lodging, grain protein, and HVAC (durum only). Not all data was collected at all locations. 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 2-4. 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.

### Acknowledgments

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Table 1. Cultural practices for the small grains variety trial at Casa Grande, Maricopa, and Yuma in 2020.

Cultural information	Maricopa (UA)	Casa Grande (APB)	Yuma early planting (SNR)	Yuma late planting (SNR)
Previous crop	Fallow	Cotton	Romaine	Broccoli
Soil texture	Sandy loam	---	Imperial Loam	Imperial Loam
Planting date	12/18/19	1/15/20	1/4/20	1/24/20
Irrigation dates and amounts	12/18: 7.18 in 2/5: 3.96 in 2/28: 4.33 in 2/28: 4.33 in 3/18: 4.34 in 4/2: 2.60 in 4/16: 4.64 in 4/30: 3.14 in SUM = 30.19 in	1/15 1/27 2/21 3/9 3/31 4/13 4/25	1/4 Sprinkle Germ 2/19 Flood 3/30 Flood 4/25 Flood	1/24 Sprinkle Germ  Post germination irrigation dates not available
Nitrogen application dates and amounts	<u>46-0-0</u> 2/05: 101 lb N/A 2/28: 51 lb N/A 3/18: 36 lb N/A  <u>32-0-0</u> 4/02: 35 lb N/A 4/16: 34 lb N/A SUM = 257 lb N/A	<u>32-0-0</u> 2/21: 35.4 lb N/A 3/09: 35.4 lb N/A 3/31: 70.8 lb N/A 4/13: 35.4 lb N/A SUM = 177 lb N/A	<u>32-0-0</u> 2/19 :75 lb N/A 3/30: 90 lb N/A 4/25: 90 lb N/A Sum = 255 lb N/A	Sum= 275 lb N/A
Phosphorus application date and amount	None	None	None	None
Pesticides	None	---	Affinity/Aim Weed Control	Affinity/Aim Weed Control

Table 2. Barley yield results from small grain variety test conducted at Casa Grande by APB and Maricopa by UA in 2020.

Entry	Source*	Grain yield	Test weight	Plant height	Lodging	Heading	Seed Weight	Grain protein
		lb/acre	lb/bu	inches	%		mg	%
<b>Casa Grande</b>								
Baretta	APB	5422	49.9	24	0	4/13	43.5	11.6
Kopious		6273	50.9	21	0	4/11	40.0	10.2
Cochise	HSG	5368	50.2	21	0	4/10	39.5	11.0
Nebula		4595	50.1	25	5	4/13	45.4	11.3
Diamondback		5933	51.1	25	3	4/10	42.1	12.5
CG916-926		5103	51.4	26	0	4/10	33.2	10.7
Average		5449	50.6	23	1	4/11	40.6	11.2
CV (%)		9.9						
LSD <sub>.05</sub>		814						
<b>Maricopa</b>								
Baretta	APB	6118	51.2	33	0	---	53.3	11.2
Kopious		6580	50.6	30	0	---	48.3	9.9
Cochise	HSG	6444	49.7	30	0	---	43.3	10.5
Nebula		---	47.5	33	0	---	50.8	11.5
Diamondback		6101	50.1	31	0	---	47.8	11.4
CG916-926		5922	48.8	35	0	---	39.5	10.2
Average		6233	49.6	32	0	---	47.1	10.8
CV (%)		3.4						
LSD <sub>.05</sub>		293						
<ul style="list-style-type: none"> <li>• APB = Arizona Plant Breeders, HSG = Highland Specialty Grains</li> </ul>								

Table 3. Durum yield results from a small grain variety test conducted at Casa Grande by APB and Yuma at two different planting dates by SNR in 2020.

Entry	Source*	Grain yield	Test weight	Plant height	Lodging	Heading	Flowering	HVAC	Seed weight	Grain protein
		lb/acre	lb/bu	inches	%			%	%	%
<b>Casa Grande</b>										
Alberto	APB	5207	62.3	24	0	4/09	---	100	50.2	14.8
Tiburon		5607	62.4	32	0	4/10	---	100	52.0	15.0
Westmore HP		4862	61.6	32	0	4/06	---	100	42.8	15.4
Powell	SNR	5424	64.0	32	0	4/08	---	100	49.5	15.4
WB-Mead		6429	63.4	35	0	4/11	---	100	46.5	14.6
WB-Mohave		5119	62.8	34	0	4/08	---	100	45.6	15.0
Desert Gold	WM	5825	62.7	34	0	4/12	---	100	42.7	14.2
Desert King HP		4676	59.0	30	0	4/11	---	100	39.2	16.5
Average		5394	62.3	32	0	4/09	---	100	46.1	15.1
CV (%)		10.0								
LSD <sub>.05</sub>		790								
<b>Yuma planted January 4</b>										
Alberto	APB	5819	61.3	29	10	---	4/07	100	48.9	16.0
Tiburon		7695	62.6	34	10	---	4/06	100	55.0	15.2
Westmore HP		6071	61.3	33	83	---	3/30	100	40.6	16.9
Powell	SNR	8004	63.5	32	13	---	3/31	100	54.4	15.0
WB-Mead		7772	63.5	35	10	---	4/09	99	48.3	14.9
WB-Mohave		6786	63.4	33	37	---	3/31	100	50.0	15.8
Average		7024	62.6	33	27	---	4/04	100	49.6	15.6
CV (%)		7.4								
LSD <sub>.05</sub>		950								
<b>Yuma planted January 24</b>										
Alberto	APB	6151	---	28	10	---	---	---	---	---
Tiburon		6627	---	35	10	---	---	---	---	---
Westmore HP		6679	---	35	33	---	---	---	---	---
Powell	SNR	6811	---	33	10	---	---	---	---	---
WB-Mead		6098	---	35	23	---	---	---	---	---
WB-Mohave		6494	---	34	10	---	---	---	---	---
Average		6477	---	33	16	---	---	---	---	---
CV (%)		2.2								
LSD <sub>.05</sub>		306								

\* APB = Arizona Plant Breeders, SNR = Second Nature Research, and WM = Western Milling

Table 4. Durum yield results from a small grain variety test conducted at Maricopa by UA in 2020. Grain yield data for certain varieties is missing due to bird damage. No lodging was observed in this trial. Average grain protein (11.8%) and average HVAC (88%) were very low in this trial and not reported because they were not representative of potential varietal performance.

Entry	Source*	Grain yield	Test weight	Seed weight	Plant height
		lb/acre	lb/bu	mg	inches
<b>Maricopa</b>					
Alberto	APB	5920	63.0	53.5	29
Tiburón		6325	62.6	57.3	33
Westmore HP		5855	64.0	43.5	36
Powell	SNR	---	64.0	55.3	32
WB-Mead		6072	62.9	43.8	37
WB-Mohave		5532	63.9	48.0	36
ASC122	WM	---	65.5	56.8	37
Desert Gold		6158	62.5	47.0	36
Desert King		5789	63.1	45.0	37
Miwok		6182	64.8	54.5	35
Platinum	Dunn	6022	64.0	45.3	32
Phoenix		6498	64.1	41.5	42
Topper		6568	64.6	43.5	37
Maestrале	Allstar	---	63.1	45.0	42
Saragolla		5970	64.0	46.0	35
ASC123		6837	63.6	52.8	37
ASC124		5263	62.0	44.0	32
ASC129		5762	63.1	49.8	38
Average		6050	63.6	48.5	36
CV (%)		5.8			
LSD <sub>.05</sub>		585			

• APB = Arizona Plant Breeders, SNR = Second Nature Research, WM = Western Milling, Dunn = Dunn Grain, Allstar = Allstar Seed



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