

# Small Grains Variety Evaluation at the Maricopa Agricultural Center, 1996

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## Introduction

Small grain varieties were tested at the Maricopa Agricultural Center as part of the on-going effort to assess variety productivity and characteristics. Barley, durum, and wheat experimental and commercial cultivars were tested. The purpose of the annual tests at Maricopa is to characterize new varieties in terms of yield potential, relative maturity, quality, and other characteristics. The variety trials at Maricopa 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.

## Procedure

Barley, durum, and wheat varieties were evaluated at the Maricopa Agricultural Center on Field 1, borders 103-105. The soil type was a Trix clay loam. The field was in sudangrass the previous summer. Preplant soil nitrate was 18 ppm NO<sub>3</sub>-N and preplant soil phosphate was 17 ppm P. Seed was planted into dry soil on November 15 and 16, 1995, and a germination irrigation was applied on November 16. The seed was planted with a cone planter in seven rows spaced 8 inches apart. The seeding rate was approximately 100 pounds of seed per acre. The plots were 5.67 ft. x 20 ft. The plots were trimmed to 16 ft. with a rototiller and the entire plots were harvested. The experimental design was a randomized complete block design and the number of replications and entries varied by crop: barley - 5 replications and 15 entries, durum - 4 replications and 33 entries, and wheat - 5 replications and 24 entries.

The plots were irrigated on November 16, January 12, February 16, March 7, March 22, April 5, April 17. Urea ammonium nitrate solution (32-0-0) was applied in the irrigation water at a rate of 100 lbs N/A on January 12, 50 lbs N/A on February 16, and 50 lbs N/A on March 7, and 30 lbs N/A on March 22 for a total of 230 lbs N/A. The plots were harvested with a small plot combine during late May. The following data was collected: grain yield, grain protein, test weight, kernel weight, plant height, lodging, heading date, anthesis date, and physiological maturity date (defined when glumes turn color). Grain protein was determined using an NIR whole grain analyzer. Kernel weight and yellow berry were determined from 10 g of hand picked seed.

## Discussion

Yield and plant characteristics are presented in Table 1. This trial represents one set of conditions. No definite conclusions are intended to be made from this data since varieties are known to be greatly affected by environmental conditions. The environmental conditions for this test were unique as usual. Minimum temperatures rarely dropped below freezing and the season was dry. Temperature during the grain fill period was relatively warm. Nitrogen fertility levels appeared to be adequate based on yields the dark green appearance of the plants. The plants tillered quite well. Unfortunately, the crop lodged severely during the second to last irrigation on April 5 and yields were probably reduced due to this. The results of this trial are useful when combined with data from other years.

## Acknowledgments

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Table 1. Small grain variety yield results from Maricopa, 1996.

Entry	Source <sup>a</sup>	Grain	Grain	Test	1000	Yellow	Plant	Lodging	Heading	Anthe- sis <sup>d</sup>	Physio- logical Mature <sup>e</sup>
		Yield <sup>b</sup>	Protein <sup>c</sup>	Weight	Kernel	Berry	Height				
		lbs/acre	%	lb/bu	g	%	inches	%			
<u>Barley</u>											
7005	APB	4936	—	49.2	35.5	—	31	66	3-05	3-05	4-16
Mucho	APB	3947	—	50.6	45.8	—	30	72	2-20	2-24	4-05
7001	APB	5800	—	53.6	45.2	—	34	70	3-07	3-07	4-19
B713	APB	5339	—	49.2	36.7	—	30	50	3-04	3-04	4-18
BA1129	SW	5032	—	52.5	45.8	—	33	70	3-03	3-03	4-17
BA7032	SW	6175	—	51.2	40.3	—	35	46	3-09	3-10	4-25
BA2391	SW	5061	—	51.5	41.3	—	28	78	2-20	2-24	4-01
BA7128	SW	5464	—	53.2	44.2	—	33	26	3-08	3-08	4-21
BA8055	SW	5954	—	53.6	42.5	—	32	74	2-28	3-02	4-19
Max	SW	6223	—	53.8	44.1	—	32	68	3-10	3-10	4-23
Gustoe	WPB	5531	—	51.5	46.9	—	31	78	3-08	3-08	4-20
Barcott	WPB	3352	—	54.3	43.5	—	35	66	2-21	2-21	3-29
DA587-124-c	WPB	5435	—	54.2	40.8	—	30	78	3-04	3-05	4-17
DA592-47	WPB	6348	—	56.9	50.5	—	35	34	3-02	3-03	4-19
DA593-078	WPB	6318	—	54.0	38.8	—	31	12	3-05	3-04	4-18
AVERAGE		5394	—	52.6	42.8	—	32	59	3-02	3-03	4-16
<u>Wheat</u>											
Cavalier	SW	5618	13.5	63.5	48.8	0	35	26	3-11	3-15	4-26
BR1283	SW	5522	12.9	62.5	49.0	1	37	58	3-10	3-15	4-26
BR7073B	SW	5215	13.3	62.9	48.3	1	35	52	3-06	3-12	4-26
BR1231	SW	4802	12.2	62.8	42.1	2	36	70	3-09	3-14	4-26
BR2222	SW	4686	13.7	61.4	41.7	6	36	72	3-05	3-11	4-28
BR5904	SW	5282	13.5	63.5	46.1	2	37	38	3-12	3-16	4-27
BR5246	SW	5090	13.6	63.2	44.0	1	35	80	3-11	3-16	4-27
BR8631-1	SW	5215	13.0	62.9	44.6	3	34	42	3-07	3-12	4-24
BR7997	SW	5070	11.9	63.4	42.2	4	34	68	3-06	3-12	4-27
BR6428	SW	4076	13.2	62.3	47.6	1	37	82	3-11	3-15	4-27
BR1434	SW	4648	14.8	62.8	39.1	2	44	48	3-02	3-09	4-25
BR1235	SW	5253	12.8	63.7	44.7	1	34	34	3-14	3-18	4-28
Rich	SW	4072	13.5	63.0	46.2	2	32	72	3-08	3-13	4-26
DA989-20	WPB	5022	13.2	63.7	43.5	1	33	60	3-07	3-13	4-26
Cuyama	WPB	5253	12.9	63.2	42.2	0	38	60	3-05	3-11	4-27
PH989-80W	WPB	5800	13.1	62.7	41.0	0	32	32	3-11	3-16	4-27
DA992-130	WPB	4802	13.1	63.0	46.6	0	32	52	3-07	3-12	4-25
Brooks	WPB	5464	13.1	64.0	45.3	1	33	74	3-03	3-08	4-25
9003WR	APB	4928	12.9	63.4	41.1	13	33	58	3-07	3-12	4-26
W692	APB	5589	13.1	65.6	44.1	3	32	60	3-05	3-11	4-26
Delano	APB	5253	13.0	64.6	55.6	9	32	62	2-23	3-02	4-25
9006WR	APB	5656	12.4	63.6	41.8	19	31	36	3-08	3-13	4-26
Seri 82	Cimmyt	5882	12.0	61.8	43.6	3	40	38	3-12	3-18	4-27
Yecora rojo	UC	4836	13.3	64.3	46.0	2	34	62	3-03	3-10	4-24
AVERAGE		5126	13.3	63.3	44.8	3	35	56	3-07	3-13	4-26

Table 1 (con'd). Small grain variety yield results from Maricopa, 1996.

Entry	Source <sup>a</sup>	Grain	Grain	Test	1000	Yellow	Plant	Lodging	Heading	Anthe- sis <sup>d</sup>	Physio- logical
		Yield <sup>b</sup>	Protein <sup>c</sup>	Weight	Kernel	Berry	Height				Mature <sup>e</sup>
		lbs/acre	%	lb/bu	g	%	inches	%			
<b>Durum</b>											
Aldura	NK	5972	13.6	64.2	54.8	1	37	16	3-12	3-20	4-28
Kronos	APB	4611	13.4	61.6	49.4	2	34	90	2-27	3-08	4-25
D875	APB	5378	13.6	63.2	49.3	1	35	95	3-08	3-12	4-28
Minos	APB	5344	13.6	64.4	51.5	3	39	73	3-07	3-12	4-28
D872	APB	5852	13.4	61.8	46.6	5	36	85	3-08	3-14	4-27
D873	APB	5498	13.7	63.8	46.2	4	37	45	3-09	3-15	4-29
Ocotillo	APB	5258	14.8	63.3	54.1	0	41	80	3-06	3-13	4-28
8009	WPB	5690	13.4	64.4	52.6	1	39	83	3-03	3-09	4-24
8010	WPB	5558	13.4	62.8	57.4	1	35	95	3-06	3-11	4-27
8014	WPB	6051	12.7	65.0	51.9	3	35	83	3-01	3-08	4-28
Cortez	WPB	7022	13.3	63.3	51.1	1	39	15	3-15	3-24	5-04
Kofa	WPB	4910	15.2	63.0	63.0	0	38	63	3-08	3-13	4-29
Aconchi	Cimmyt	5354	13.2	65.5	55.2	10	38	78	3-09	3-18	4-30
WB 881	WPB	4664	14.6	62.8	60.2	0	38	56	3-06	3-12	4-26
8011	WPB	5996	13.4	64.2	59.0	2	38	48	3-05	3-11	4-25
WB Turbo	WPB	6026	12.3	63.4	55.9	11	41	43	3-13	3-21	5-03
8013	WPB	5846	14.4	63.5	53.9	2	35	55	2-27	3-08	4-24
D3215	SW	6234	13.6	63.5	53.9	0	36	58	3-12	3-19	5-02
D3294	SW	6134	12.7	64.7	50.5	9	35	58	3-10	3-16	4-29
D3178	SW	5366	13.3	63.6	48.4	2	35	73	3-07	3-13	4-29
D1856	SW	6266	13.8	63.7	57.2	2	36	35	3-10	3-15	4-29
D2620	SW	5534	13.6	63.3	54.7	2	37	73	3-07	3-15	4-29
D1405	SW	6902	13.2	63.3	51.2	1	38	23	3-12	3-18	4-29
D9430	SW	5988	13.3	64.4	52.8	1	35	50	3-08	3-16	4-28
D3240	SW	6110	13.5	62.9	59.9	0	37	75	3-10	3-18	4-29
DOI933	SW	5606	13.5	62.3	60.3	15	35	90	3-01	3-08	4-28
Eddie	SW	6909	14.0	63.2	56.8	3	40	45	3-06	3-12	4-29
Duraking	SW	6890	13.2	64.0	53.2	2	35	50	3-09	3-17	4-29
D2659	SW	6074	13.0	63.8	48.0	5	37	63	3-09	3-19	5-05
Ria	SW	5414	12.9	63.2	49.1	3	39	63	3-10	3-15	4-29
Durex	SW	4062	14.9	62.2	57.8	1	40	38	3-06	3-12	4-28
Reva	SW	5354	13.9	63.4	56.3	1	36	78	3-09	3-15	4-29
Unidur	SW	5690	13.3	64.3	51.2	5	36	35	3-13	3-19	4-30
AVERAGE		5744	13.6	63.5	54.0	3	37	59	3-08	3-14	4-28

<sup>a</sup> Source: APB = Arizona Plant Breeders, Cimmyt = International Maize and Wheat Improvement Center, NK = Northrup King, SW = Seeds West, UC = University of California, and WPB = Western Plant Breeders

<sup>b</sup> Grain yield: LSD (5%) = 676, 866, and 805 lb/acre and cv = 9.7, 10.0, and 12.6% for barley, durum, and wheat, respectively. Grain yield reported on an "as is" moisture basis which was about 8%.

<sup>c</sup> Grain protein reported on a 12% moisture basis

<sup>d</sup> Anthesis = first day of pollen shed

<sup>e</sup> Physiological maturity defined as when glumes turn brown.