Final Report

Arizona Grain Research and Promotion Council

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Small Grains Variety Testing, 2017

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Small Grains Variety Evaluation at Maricopa, 2017

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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. The field was fallow the previous year and the soil texture is a sandy loam. Soil chemical properties from a sample taken before planting are listed in Table 1. 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 21 durum entries. Growing conditions are listed in Table 2.

The following data was collected: grain yield, test weight, seed weight, plant height, lodging, grain protein, and HVAC (durum 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 Table 3. 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 .

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Table 1. Soil chemical analysis from a sample collected preplant from the surface 6 inches for a small grain variety trial at the Maricopa Ag Center, 2017.

Chemical measurement	Unit	Value	Unit	Value
Total Exchange Capacity	(meq/100 g)	20.62	---	---
pH	(pH)	8.4	---	---
Organic Matter	(%)	0.92	---	---
Estimated Nitrogen Release	(lb N/acre)	37	---	---
NO_3-N	(ppm)	37.7	---	---
NH_4-N	(ppm)	24.3	---	---
S	(mg/kg)	30	---	---
P	(mg/kg)	4	---	---
Ca	(mg/kg)	3237	(%)	78.49
Mg	(mg/kg)	221	(%)	8.93
K	(mg/kg)	332	(%)	4.13
Na	(mg/kg)	259	(%)	5.46
Fe	(mg/kg)	3	---	---
Mn	(mg/kg)	6	---	---
Cu	(mg/kg)	1.28	---	---
Zn	(mg/kg)	0.73	---	---

Table 2. Cultural practices for a small grains variety trial at the Maricopa Ag Center, 2017.

Cultural information	Maricopa
Previous crop	Fallow
Soil texture	Sandy loam
Planting date	12/07/2016
Irrigation dates and amounts	Date Inches 12/07 3.50 1/09 3.42 1/31 3.80 2/27 4.16 3/16 4.09 3/30 4.00 4/13 4.07 4/26 3.80 Sum 30.84
Nitrogen dates and rate (of UAN 32)	Date lbs N/A 1/30 102 2/24 51 3/15 56 3/30 39 Sum 248
Phosphorus (date, lbs P_2O_5/A, fertilizer)	None
Herbicide	Bromoxynil at 1.02 pts/acre on 2/24
Plant growth regulator	Palisade EC at 14.2 oz/acre on 2/14
Harvest date	5/23/2017

Table 3. Barley and durum variety yield results from the Maricopa Ag Center, 2017.

Entry	Source	Grain yield	Test weight	Seed weight	Plant height	Lodging	HVAC	Grain protein
		lb/acre	lb/bu	mg	inches	%	%	%
				Barley				
Baretta	APB	5602	54.7	41.4	27	3	---	14.4
Kopious	APB	4825	53.5	36.2	31	0	---	13.0
Chico	HSG	4241	54.0	31.5	27	3	---	15.4
Cochise	HSG	5025	53.4	32.2	30	4	---	14.4
Nebula	HSG	4335	55.9	43.0	29	1	---	13.8
Avg		4806	54.3	36.9	29	2	---	14.2
CV (%)		12.6	936					
$LSD_{.05}$		936	12.6					
				Durum				
APB335	APB	5292	62.4	52.8	33	0	98	15.9
Helios	APB	5379	62.4	49.8	32	0	100	14.6
Kronos	APB	5223	61.9	56.4	35	25	99	15.2
Tiburon	APB	6714	63.0	59.5	32	0	99	13.9
Westmore HP	APB	5669	62.7	44.9	31	19	98	15.7
Candura	Dunn	6170	63.1	48.6	32	0	99	14.3
Duraking	Dunn	6414	64.3	51.6	30	0	98	14.3
Platinum	Dunn	6307	64.0	49.6	33	0	99	14.7
Topper	Dunn	6936	62.4	39.3	31	5	99	13.4
Havasu	SNR	5102	64.4	53.6	37	2	99	14.9
Orita	SNR	6271	59.2	44.9	33	0	100	14.5
WB-Mead	SNR	6401	61.9	44.0	36	0	98	14.0
WB-Mohave	SNR	6217	63.6	50.4	35	0	99	14.1
ASC-100	Allstar	6664	62.5	47.7	33	0	99	14.8
ASC-101	Allstar	5293	64.0	54.4	33	25	98	12.9
ASC-102	Allstar	5088	64.4	59.6	31	28	99	13.9
ASC-103	Allstar	6020	63.8	47.0	30	0	97	13.1
Colombo	Allstar	5655	62.0	41.1	35	0	99	14.4
Maestrale	Allstar	Bird damage	62.9	49.6	30	73	99	13.8
Desert King	UC	6210	60.2	41.0	34	0	98	12.9
Miwok	UC	7062	63.0	57.6	33	18	98	14.4
Avg		5799	62.8	49.7	33	9	99	14.3
CV (%)		10						
$LSD_{.05}$		823						

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