Small Grain Variety Trials
Safford Agricultural Center, 2002

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Abstract

Small plot replicate trials were established to test nineteen durum wheat varieties, three varieties of bread/feed wheat and six varieties of barley. D1856, an experimental, was the leading durum wheat variety, Cavalier from World Wide Wheat the highest yielding bread/feed wheat variety and Commander was the highest yielding barley. All three varieties were entries from World Wide Wheat. A three year summary is also provided in this paper.

Introduction

The durum wheat, bread/feed wheat and barley variety testing program has continued through the years, except for the 1997 crop year when wheat was not grown on the Agricultural Center. This is done to provide current varietal evaluations for farmers who are able to fit small grains into their crop rotation. Crop rotations remain desirable instead of the cotton mono-culture used by many farmers in the county, but economics have precluded the use of small grains from most farmer's cultural practices.

Materials and Methods

Experimental plots were rowed-off and firmed with a roller prior to planting the variety trials so seed placement would be somewhat consistent from top of beds to bottom of furrows. Plots were planted with a 12-foot International grain drill with fertilizer attachment, over four 36" beds. The cultural practices applied are described below in the crop history.

Crop History:

Previous crop: Cotton
Soil type: Pima clay loam variant (Barley)/ Pima silty clay variant (Wheat/Durum)
Planting date: 19 December 2001 Watered up: 20 December 2001
Seeding rate: 150 lbs/ac
Fertilizer: 200 lbs/ac of 16-20-0 at planting
200 lbs/ac urea side dressed on 5 February and 2 April
Herbicide: 2-4,D applied on 8 April to control broad-leafed weeds
Insecticide: None
Irrigation: Furrow, watered up and 8 irrigations applied at 45% soil water depletion (approximately 38.2 ac. in.)
Rainfall during the growing season: 3.14 inches
Plot size: 4 rows (12 feet) wide by 45 feet long
Harvest date: Barley 18 June, Wheat 15 July 2002
Heat Units (40/81EF) from watering-up to maturity: 3165 HU

The plots were harvested using a Gleaner Model K combine, catching the grain from each plot in a 5 gallon bucket in the grain bin. These buckets were weighed using a hanging scale and samples were taken to determine percent moisture and bushel weight.

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Results and Discussion

Yield results for the durum wheat variety study are available in Table 1 together with data on grain quality and other agronomic variables. D1856, an experimental from World Wide Wheat, was the highest yielding variety with a yield of 3059 pounds per acre. This cultivar yielded slightly more (not statistically significant) than Platinum, which provided the highest yield in the previous 2 years (1, 2). Bushel weights and 1000 kernel weights were slightly lower than the previous two years. Table 2 shows durum yields of twelve varieties over a three year period. Platinum had the highest average yield with Topper following closely behind. It should be noted that Topper was not in the current study so a weighted average was calculated for comparison.

Table 3 contains the yield and agronomic information for the bread and feed wheat variety study. Only three varieties were compared in this study and Cavalier, a strong yielding variety over the past 3 years, produced the highest grain yield. Yields were down compared with the past two years, but the protein content was extraordinarily high. A three year summary was not compiled for this wheat because of the small number of varieties that were grown over the three year period.

Information on the barley variety study is found in Table 4. Yields were lower compared with the 2001 season but higher than the 2000 season. Commander produced the highest yield in the current study with a yield around 900 pounds more per acre than the next variety. Bushel weights and plant heights were lower than the past two years, indicating that more irrigation would probably have produced taller plants and perhaps increased yield and bushel weights. Table 5 contains a three year summary of barley variety yields. Max produced the highest three-year average yield, but had quite a bit of variability from year to year. Commander was next in yield and was a bit more consistent from year to year, but Patti, with the third highest average, was the most consistent from year to year.

References

1. Clark, L.J. and E.W. Carpenter. 1999. Small grain variety trials, Safford Agricultural Center, 1999. Forage and Grain, A College of Agriculture Report, The University of Arizona, Tucson, AZ. Series P-118, pp. 107-110.

2. Clark, L.J. and E.W. Carpenter. 2000. Small grain variety trials, Safford Agricultural Center, 2000. Forage and Grain, A College of Agriculture Report, The University of Arizona, Tucson, AZ. Series P-124, pp. 131-134.

3. Clark, L.J. and E.W. Carpenter. 2001. Small grain variety trials, Safford Agricultural Center, 2001. Forage and Grain, A College of Agriculture Report, The University of Arizona, Tucson, AZ. Series P-128, pp. 63-66.

Table 1. **Yield and other agronomic data from the durum wheat variety trial, Safford Agricultural Center, 2001-2002.**

Variety	Source	Yield per acre @10% M	Bushel Weight	Percent Moisture	Percent Protein	1000 Kernel Weight(g)
D1856	www	3059.4 a[1]	58.2 abc	9.90 a	16.33	43.5
Platinum	www	3036.1 a	58.5 ab	10.18 a	17.20	49.0
Duraking	www	2954.8 ab	58.0 abc	10.35 a	17.07	31.5
D6575	www	2871.1 abc	58.8 a	9.75 a	16.73	47.5
Crown	www	2812.4 a-d	57.0 c	9.62 a	18.29	49.5
Orita	wpb	2772.2 a-d	57.5 abc	9.88 a	17.36	40.0
Mohawk	wpb	2772.2 a-d	58.2 abc	10.08 a	17.07	39.5
Sky	apb	2715.3 a-d	57.8 abc	9.75 a	16.04	46.5
Bravadur	www	2683.9 a-d	57.8 abc	9.98 a	17.09	43.0
Kofa	wpb	2681.9 a-d	57.8 abc	9.83 a	16.74	43.0
D1128	www	2598.5 a-d	57.2 bc	9.92 a	16.23	41.5
YU 895-130	wpb	2550.8 a-d	58.6 ab	10.05 a	16.28	49.0
Ocotillo	apb	2534.6 a-d	57.9 abc	9.90 a	16.10	39.0
D1138	www	2513.2 a-d	58.8 a	10.12 a	16.12	45.0
Ria	www	2274.7 b-e	57.8 abc	10.28 a	17.70	41.5
Matt	apb	2274.4 b-e	58.0 abc	10.42 a	17.42	42.5
Kronos	apb	2199.4 cde	58.0 abc	9.55 a	16.28	49.5
D8267	www	2133.2 de	57.2 bc	10.25 a	17.32	40.5
Tacna	wpb	1644.3 e	58.0 abc	10.05 a	16.80	47.5
Average		2583.3	57.9	9.99	16.9	43.6
LSD (05)		692.3	1.42	0.90	--	--
CV (%)		18.9	1.73	6.37	--	--

1. Values followed by the same letter, within a column, are not significantly different at the 95% level of confidence using Duncan's Multiple Range test.

Table 2. Durum wheat yields by variety over three years of study.

Variety	Yield (pounds per acre)			Average
	2000	2001	2002	
Platinum	4550	3496	3036	3694.0
Topper	4499	3255	3047.33[1]	3600.4
Duraking	3832	3237	2955	3341.3
Kofa	4506	2649	2682	3279.0
Bravadur	3846	2846	2684	3125.3
Matt	4045	2780	2274	3033.0
Crown	3412	2654.04[1]	2812	2959.3
Kronos	3890	2754	2199	2947.7
Ria	3894	2636	2275	2935.0
Mohawk	3781	1689	2772	2747.3
Deluxe	3756	2112	2228.22[1]	2698.7
Tacna	3285	1855	1644	2261.3
Averages	3941.3	2663.6	2550.7	3051.9

1. Missing data approximated by weighted averages.

Table 3. Yield and other agronomic data from the wheat variety trial, Safford Agricultural Center, 2001-2002.

Variety	Source	Yield/acre @10% M	Bushel Weight	Percent Moisture	Percent Protein	1000 kernel wt(g)
Cavalier	www	3416.6 a[1]	61.2 a	10.10 a	16.42	45.8
Yecora Rojo	uc	3312.3 ab	61.8 a	9.95 a	16.33	39.2
CO1957-3	www	3037.3 b	61.5 a	9.98 a	17.02	35.0
Average		3255.4	61.5	10.01	16.6	40
LSD (05)		370.78	1.04	0.89	--	--
CV (%)		6.58	0.98	5.13	--	--

1. Values followed by the same letter, within a column, are not significantly different at the 95% level of confidence using Duncan's Multiple Range test.

Table 4. Yield and other agronomic data from the barley variety trial grown on the Safford Agricultural Center, 2001-2002.

Variety	Source	Yield/ac @ 10% M	Bushel Weight	Percent Moisture	1000 kernel weight	Plant Height
Commander	www	5169.6 a[1]	50.8 a	9.0 a	44.5	20.8 a
Baretta	apb	4280.2 b	50.5 a	8.5 a	50.0	20.5 a
Patti	www	4211.6 b	47.0 b	9.4 a	46.5	20.4 a
Max	www	4053.4 b	49.5 ab	8.8 a	49.5	20.0 a
Barcott	wpb	2932.4 c	49.0 ab	9.0 a	44.0	16.1 b
Mucho	apb	2227.4 c	49.0 ab	9.2 a	48.0	16.8 b
Average		3812.4	49.3	9.00	47.1	19.1
LSD(05)		861.8	3.10	1.68	--	2.89
CV(%)		15.0	4.17	12.4	--	10.0

1. Values followed by the same letter, within a column, are not significantly different at the 95% level of confidence using Duncan's Multiple Range test.

Table 5. Barley yields by variety over three years of study.

Variety	2000	2001	2002	Average
Max	3525	6353	4053	4643.7
Commander	3292	5264	5170	4570.1
Patti	4724	4538	4212	4491.3
Baretta	3450	5717	4280	4486.8
Nebula	3568	4538	3942.51[1]	4016.2
Barcott	2595.66[1]	3812	2932	3113.2
Mucho	3343	2625.69[1]	2227	2731.9
Average	3711.8	5282.0	4331.5	4441.6

1. Missing data approximated by weighted averages.