

Small Grain Variety Trials Safford Agricultural Center, 1999

L.J. Clark and E.W. Carpenter

Abstract

Small plot replicate trials were established to test thirteen durum wheat varieties, nine varieties of bread/feed wheat, and five varieties of barley. Trump was the leading durum wheat variety with a yield of 3470 pounds per acre. Stander, a variety from Resources Seeds Int'l in California, was the top producing wheat variety with a yield of 5780 pounds per acre and Max produced the highest barley yield with 5792 pounds per acre. Except for the durum varieties, most varieties in the study produced reasonable yields in 1999.

Introduction

The barley, wheat and durum wheat variety testing program have continued through the years, our objective is to provide current varietal evaluations for farmers who are able to fit small grains into their rotation. It is desirable to have a rotation instead of a cotton mono-culture in Graham county, but the economics of growing small grains over the past decade have not been very favorable.

Materials and Methods

Prior to planting the variety trials, the ground is prepared and beds are pulled and firmed, so seed placement will be somewhat consistent from top of beds to bottom of furrows. Plots were planted with a six-foot Van Brunt grain planter with fertilizer attachment, over two 36" beds. The cultural practices applied are described below in the crop history.

Crop History:

Previous crop: Cotton

Soil type: Pima clay loam variant

Planting date: 22 December 1998

Watered up: 23 December

Seeding rate: 200 lbs/ac

Fertilizer: 200 lbs/ac 16-20-0 at planting, 200 lbs/ac urea side dressed on 19 February

Herbicide: 2-4,D applied on 29 March to control broad-leafed weeds

Insecticide: None

Irrigation: Furrow, watered up and 10 irrigations applied at 45% soil water depletion (from AZSCHED)

(approximately 40 acre in)

Rainfall during the growing season: 2.8 inches

Plot size: 2 rows (6 feet) wide by 45 feet long

Harvest date: Barley 22 June, Wheat 29 June 1998

Heat Units (40/81°F) from watering-up to harvest: Barley - 3491 HU, Wheat - 3751 HU

The plots were harvested using a Gleaner Model L 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 moisture and bushel weight.

Results and Discussion

Results of the durum wheat study are found in Table 1. For some reason, this trial didn't take off and grow in the early spring and the yields show it. The highest yielding variety didn't yield as high as the lowest yielding variety in 1998 (1). Yields as high as 4 tons per acre are achieved in other parts of the county on a regular basis, but on the salty soils of the Agricultural Center, this is a rare event. Trump, a new variety from World Wide Wheat, produced the highest yield at 3470 pounds per acre. Bushel weights were about a pound per bushel lighter than in the previous year, but 3 to 4 pounds lighter than our bread/feed wheat study. Kernel weights and plant heights were also much lower than last year indicating that the plants didn't thrive in 1999. The interesting part was the percent protein, they were almost 2% higher this year than last. And, HVAC were not determined this year because no kernels were found that had yellow berry.

Bread and feed wheat variety studies are reported in Table 2. The highest yielding variety, Stander (Resources Seeds International, Woodland, CA) was placed in the trial because of the strength of its sister line, RSI 5, which was the highest yielding variety in 1998. Yields were not as high in 1999 as in the previous year, but were in the acceptable range. Bushel weights and percent protein were much higher than last year, whereas kernel weight and plant height were lower. As with the durum wheat, no yellow berry was seen in any of the varieties, hence a HVAC analysis was not performed. Similar to last year's trial, the highest yielding variety had the lowest protein percent. The interesting thing to note is that another sister line, Bonus, yielded within a couple of hundred pound per acre of the top variety, but had a protein content above the average.

Table 3 contains the yield and agronomic information on the barley variety study. Few varieties were obtained for testing, but of those tested Max produced the highest yield. Comparing with last year, this year's yields were much lower, plant heights were much shorter and kernel weights were much lower. The cool spring and early summer probably boosted the yields above our normal averages, but conditions were not as good as 1998.

References

1. Clark, L.J. and E.W. Carpenter. 1998. Small grain variety trials Safford Agricultural Center, 1998. Forage and Grain, A College of Agriculture Report, The University of Arizona, Tucson, AZ. Series P-114, pp. 97-101.
2. Ottman, M.J. and M.T. Rogers. 1998. Small grain variety evaluation at Marana, Maricopa and Yuma, 1998. Forage and Grain, A College of Agriculture Report, The University of Arizona, Tucson, AZ. Series P-114, pp. 102-112.

Table 1. Yield and other agronomic data from the durum wheat variety trial, Safford Agricultural Center, 1998-9.

Variety	Yield per acre @10%M	Bushel Weight	% Moisture	% Protein	1000 Kernal Weight	Plant Height	Stems per Square Foot
Trump D2656 www	3469.9 a ¹	60.5 a	6.50 b	15.8	38.8 ab	31.5 a	43.5 a
Topper D1128 www	2918.0 ab	60.5 a	7.03 ab	16.2	38.3 ab	29.5 ab	37.0 a
Utopia www	2858.2 ab	61.0 a	6.85 ab	15.8	38.8 ab	26.5 b	38.5 a
Platinum D9430www	2689.9 b	60.3 a	7.85 a	14.2	40.3 ab	25.0 b	37.3 a
Deluxe D1856 www	2576.2 b	60.3 a	7.45 ab	16.5	38.9 ab	26.3 b	44.5 a
Crown D3117 www	2531.8 b	59.8 a	6.85 ab	15.1	40.5 ab	25.8 b	39.5 a
Cortez wpb	2150.9 bc	60.0 a	7.28 ab	16.3	41.8 ab	28.0 ab	41.8 a
Kofa wpb	1664.9 cd	60.3 a	7.12 ab	14.6	43.8 ab	27.5 ab	29.8 a
Kronos apb	1617.3 cd	61.0 a	7.05 ab	16.0	39.8 ab	25.8 b	40.3 a
Rico D5318 www	1579.5 cd	59.8 a	7.35 ab	16.2	37.0 b	27.8 ab	42.3 a
Mohawk wpb	1425.7 cd	61.0 a	7.08 ab	15.6	43.3 ab	27.3 ab	43.3 a
Ocotillo apb	1185.3 cd	60.0 a	7.53 ab	17.1	40.0 ab	27.8 ab	42.3 a
Tacna wpb	1100.0 d	59.8 a	7.70 a	16.6	39.8 ab	26.5 b	41.2 a
Average	2136	60.3	7.2	15.8	40.1	27.3	40.1
LSD(05)	684.4	1.44	0.93	--	5.63	3.83	14.48
CV (%)	22.34	1.66	9.01	--	9.81	9.79	25.21

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. Yield and other agronomic data from the wheat variety trial, Safford Agricultural Center, 1998-9.

Variety		Yield per acre @10%M	Bushel Weight	% Moisture	% Protein	1000 Kernal Weight	Plant Height	Stems per Square Foot
Stander	rsi	5780.0 a ¹	63.8 a	7.85 a	13.9	39.0 b	28.3 ab	33.8 a
Bonus	rsi	5505.4 ab	62.5 a	7.13 a	15.1	42.4 ab	27.0 bcd	41.8 a
Rich	www	5474.8 ab	63.3 a	7.78 a	15.2	41.3 ab	25.8 cd	37.5 a
BR 8631	www	5376.3 ab	63.3 a	7.58 a	15.1	39.8 b	26.8 bcd	52.3 a
Cavalier	www	5349.7 ab	63.5 a	7.78 a	15.4	40.8 b	26.8 bcd	39.3 a
RSI 5	rsi	4777.5 bc	64.0 a	8.25 a	14.2	40.0 b	29.8 a	50.3 a
Yecora Rojo		4769.2 ab	63.8 a	7.75 a	16.1	44.5 a	25.3 d	33.0 a
Brooks	wpb	4396.5 c	63.8 a	8.30 a	15.8	40.6 b	27.3 bc	38.5 a
BR 9246	www	4266.3 c	63.0 a	8.33 a	14.3	41.0 b	28.3 ab	40.0 a
Average		5077.3	63.4	7.86	15.0	41	27.2	40.7
LSD(05)		799.0	1.4	1.4	--	3.1	1.6	18.0
CV (%)		10.8	1.56	12.5	--	5.2	4.1	30.3

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 3. Yield and other agronomic data from the barley variety trial grown on the Safford Agricultural Center, 1998-99.

Variety	Yield/ac @ 10% M	Percent Moisture	Bushel Weight	1000 kernal weight	Plant Height
Max	5791.6 a ¹	11.5 a	53.5 a	42.2 a	23.3 a
Gustoe	5282.9 ab	11.7 a	55.0 a	42.8 a	23.8 a
Nebula	4516.4 b	11.3 a	54.0 a	44.3 a	22.5 a
Baretta	4366.5 b	11.7 a	54.7 a	41.0 a	22.5 a
BA 2391	3065.3 c	11.5 a	54.0 a	46.0 a	21.8 a
Average	4604.6	11.5	54.3	43.3	22.7
LSD(05)	1042.7	0.49	1.73	7	2.54
CV(%)	14.7	2.78	2.07	10.5	7.26

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.