

Durum Wheat Variety Trial Safford Agricultural Center, 2003

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Abstract

Small plot replicate trials were established to test seventeen durum wheat varieties. This year the study was looking at quality issues as well as yield, to verify which varieties were high enough quality for high dollar export. Duraking, a variety from World Wide Wheat, was the leading variety, with a yield over 5500 pounds per acre. A four year summary of yields and percent protein is also provided in this paper.

Introduction

The small grain 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 monoculture used by many farmers in the county, but economics have precluded the use of small grains from most farmers' cultural practices. For the 2003 crop year a good contract was available for durum wheat, so this is where the emphasis was placed.

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 silty clay variant

Planting date: 18-19 December 2002

Seeding rate: 175 lbs/ac

Fertilizer: 300 lbs/ac of 16-20-0 at planting, 200 lbs/ac urea side dressed on 21 February and 20 April

Herbicide: None

Insecticide: None

Irrigation: Furrow, watered up and 9 irrigations applied at 45% soil water depletion (approximately 36.5 ac. in.)

Rainfall during the growing season: 0.94 inches

Plot size: 4 rows (12 feet) wide by 45 feet long

Harvest date: 7 July 2003

Heat Units (40/81EF) from watering-up to maturity: 3058 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.

Results and Discussion

Yield results for the durum wheat variety study are available in Table 1 together with data on grain quality, other agronomic variables, and a column on crop value. Duraking, a variety from World Wide Wheat, was the highest yielding variety with a yield of 5554 pounds per acre. The curious thing is that Platinum, the variety that had ranked in the top two for the past three years, ranked last in this study (1, 2, 3). Yields were considerably higher this year than in the past three years, the bushel weights and 1000 kernel weights were good and for the most part the protein percentages were good. The export contract available in Arizona required a bushel weight of 61 and had discounts for values below 59.9 pounds per bushel. Three of the variety had values below 61, but none were so low as to trigger a discount. The contract required a protein percentage of 13.1, with a maximum premium of \$5 per ton. Discounts were deducted for protein percentages below 12.9%, with a discount of \$5 per ton for values between 12.9 and 12.6 percent. Lower protein percentages had larger discounts, with a discount of \$50 per ton for 11.6%. The base value of \$150 per ton was adjusted for these premiums or discounts and then multiplied by the varietal yield to determine a gross crop value in dollars per acre. These crop values are listed in the last column of the table. Kofa, the variety specified in the contract, was in the bottom third of the varieties in the test. When asked why Kofa variety was required in the contract, it was explained that in the lower elevations in Arizona, where most of the contract durum wheat is grown, Kofa consistently produces a respectable yield and has the quality of grain the export market requires. This works to the disadvantage of the growers at higher elevations.

Table 2 shows durum variety yields and protein percentages of seven varieties over a four year period. Duraking had the highest yield average over the period with Platinum following closely behind. The protein percentages of all these varieties is in the premium range. Unfortunately, protein percentages above 13.5% are not rewarded with higher premiums.

References

1. 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.
2. 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.
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Table 1. Yield and other agronomic data from the durum wheat variety trial, Safford Agricultural Center, 2003.

Variety	Source	Yield per acre @ 10% M (lbs/ac)	Bushel Weight (lb/bu)	Percent Moisture	Plant Height (in)	Percent Protein	1000 Kernel Weight(g)
Duraking	www	5554 a ¹	61.0 abc	7.9 a	25.0 gh	13.1 de	40.0 de
D1138	www	5152 ab	61.8 abc	7.9 a	29.5 ab	13.6 bc	44.8 bc
DOI	www	5105 abc	61.8 abc	9.0 a	29.0 abc	13.2 d	48.5 a
YU 895-130	wpb	5012 a-d	61.8 abc	7.6 a	29.0 abc	13.1 de	42.0 cd
YU 899-170	wpb	4937 a-d	61.5 abc	7.4 a	26.8 c-g	13.9 ab	45.0 bc
Orita	wpb	4860 a-d	61.0 abc	7.6 a	25.8 e-h	13.8 ab	46.5 ab
Matt	apb	4826 a-d	62.0 abc	6.3 a	25.3 fgh	13.6 bc	44.8 bc
Ocotillo	apb	4775 a-d	61.0 abc	7.5 a	30.5 a	14.1 a	41.3 de
YU 897-44	wpb	4737 a-d	61.8 abc	7.8 a	28.5 a-d	13.2 de	46.5 ab
Kronos	apb	4572 a-d	62.3 ab	8.0 a	26.8 c-g	13.2 d	46.3 ab
D6523	www	4569 a-d	60.5 abc	7.2 a	29.0 abc	13.0 de	42.5 cd
Westbred 881	wpb	4377 a-d	61.5 abc	7.1 a	26.3 d-h	13.3 cd	46.8 ab
Kofa	wpb	4256 a-d	61.8 abc	6.8 a	27.8 b-e	13.4 cd	45.8 ab
Alamo	wpb	4189 a-d	62.5 a	7.7 a	27.5 b-f	13.6 bc	48.0 ab
Crown	www	3938 bcd	60.3 bc	7.3 a	30.3 a	13.8 ab	40.5 de
Mohawk	wpb	3673 cd	61.8 abc	7.4 a	25.8 e-h	12.8 ef	46.0 ab
Platinum	www	3635 d	60.0 c	7.7 a	24.3 h	12.6 f	38.5 e
Average		4597.9	61.4	7.5	27.5	13.4	44.3
LSD (05)		1216.9	1.8	2.4	2.1	0.3	2.9
CV (%)		18.6	2.1	22.4	5.4	1.6	4.5

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 four years of study.

Variety	Yield (pounds per acre)				Average
	2000	2001	2002	2003	
Duraking	3832	3237	2955	5554	3894.5
Platinum	4550	3496	3036	3635	3679.3
Kofa	4506	2649	2682	4256	3523.3
Matt	4045	2780	2274	4826	3481.3
Kronos	3890	2754	2199	4572	3353.8
Crown	3412	2654.04 ¹	2812	3938	3204.0
Mohawk	3781	1689	2772	3673	2978.8
Averages	4002.3	2751.3	2675.7	4350.6	3445.0

1. Missing data approximated by weighted averages.