

Final Report

Arizona Grain Research and Promotion Council

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Small Grains Variety Testing

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Small Grains Variety Evaluation at Yuma, 2007

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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.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 and experimental lines were tested. The purpose of these tests is to characterize varieties in terms of yield potential, relative maturity, quality, and other characteristics. Small plot variety trials 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.pdf>.

Procedure

Durum varieties were evaluated near Somerton in Yuma County by Western Plant Breeders. The seed was planted with a cone planter in seven rows spaced 7 inches apart and 20 ft long. The seeding rate was approximately 100 lbs/acre. The experimental design was a randomized complete block with 4 replications and 20 durum entries. Growing conditions are listed in Table 1. The following data was collected: grain yield, test weight, plant height, lodging, heading, grain protein, and HVAC. Grain was harvested with a small plot combine and yields are expressed on an "as is" moisture basis. HVAC was determined from 10 g of seed. Grain protein was determined using the NIRS method and expressed on a 12% moisture basis. Abbreviations for the sources of varieties are: APB = Arizona Plant Breeders, WPB = Western Plant Breeders, WWW = World Wide Wheat.

Durum and barley variety trials were also seeded at Maricopa by UA and Stanfield by WWW, and barley trials were seeded at Coolidge by WPB. The UA trials at Maricopa were not harvested due to crop injury that appeared in the beginning of March possibly due to Roundup contamination in a sprayer tank. The trials conducted by WWW in Stanfield and WPB in Coolidge were harvested, but the yields were low and averaged 3100 to 4300 lbs per acre. I have made it a policy not to publish results of variety trials where the average yield is less than 5000 lbs per acre since the results may not be representative.

Discussion

This growing season was characterized a cool December and January, warm March, and low rainfall (Table 2). The early part of the growing season (December and January) had some of the coldest minimum temperatures on record. The maximum temperatures in March were near the highest on record. This growing season was especially dry with only a trace of rainfall.

Yield and plant characteristics of the varieties are presented in Tables 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.pdf>.

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Table 1. Cultural practices for the small grains variety trial at Yuma.

| Cultural information | Yuma (WPB) |
|--|--|
| Previous crop | Lettuce |
| Soil texture | Clay loam |
| Planting date | 12/24 |
| Irrigations | 7 12/24, 2/9, 3/4, 3/21, 4/6, 4/22, 5/7 |
| Nitrogen (lbs N/a) | 240 2/9: 120 as 32-0-0 3/4: 90 as 32-0-0 3/21: 30 as 32-0-0 |
| Phosphorus (lbs P ₂ O ₅ /acre) | --- |
| Pesticides | --- |
| Harvest date | 6/6 |

Table 2. Climatic data from AZMET for Maricopa and Yuma Valley during the 2007growing season ranked and compared to the long-term average. The rankings of the months are from low to high.

| Climate variable | Unit | Year(s) | Dec | Jan | Feb | Mar | Apr | May | Dec-May |
|------------------|------------|-----------|------|------|-------------|------|------|------|---------|
| | | | | | <u>Yuma</u> | | | | |
| Max Temp. | Rank of 21 | 2007 | 15 | 3 | 14 | 19 | 14 | 14 | 14 |
| | °F | 2007 | 68 | 66 | 74 | 83 | 86 | 95 | 79 |
| | °F | 1987-2007 | 68 | 69 | 73 | 79 | 86 | 94 | 78 |
| Min Temp. | Rank of 21 | 2007 | 3 | 1 | 7 | 13 | 15 | 10 | 6 |
| | °F | 2007 | 39 | 38 | 44 | 49 | 54 | 60 | 47 |
| | °F | 1987-2007 | 41 | 42 | 45 | 49 | 53 | 60 | 48 |
| Ppt. | Rank of 21 | 2007 | 1 | 1 | 1 | 6 | 10 | 1 | 2 |
| | inches | 2007 | 0 | 0 | 0 | 0.01 | 0.01 | 0 | 0.02 |
| | inches | 1987-2007 | 0.37 | 0.31 | 0.35 | 0.34 | 0.15 | 0.04 | 1.54 |

Table 3. Durum variety yield results from **Yuma (WPB)**, 2007.

| Entry | Source | Grain Yield ^a | Test Weight | Plant Height | Lodging | Heading | Grain Protein | HVAC |
|--------------|--------|--------------------------|-------------|--------------|---------|---------|---------------|------|
| | | lbs/acre | lbs/bu | inches | % | | % | % |
| | | | | <u>Durum</u> | | | | |
| Kronos | APB | 6472 | 61.5 | 34 | 70 | 27-Mar | 14.9 | 98 |
| Matt | APB | 5954 | 61.1 | 34 | 70 | 27-Mar | 15.1 | 99 |
| Ocotillo | APB | 6050 | 61.8 | 39 | 45 | 29-Mar | 15.7 | 99 |
| Sky | APB | 6090 | 58.7 | 32 | 68 | 29-Mar | 13.9 | 97 |
| Alamo | WPB | 6431 | 63.3 | 35 | 50 | 29-Mar | 15.0 | 98 |
| Havasu | WPB | 6172 | 63.1 | 36 | 48 | 29-Mar | 15.0 | 96 |
| Orita | WPB | 7126 | 61.4 | 35 | 30 | 5-Apr | 16.3 | 95 |
| Westbred 881 | WPB | 6581 | 62.3 | 37 | 0 | 1-Apr | 15.1 | 98 |
| Crown | WWW | 7221 | 60.9 | 38 | 30 | 3-Apr | 14.4 | 99 |
| Duraking | WWW | 7535 | 63.0 | 33 | 38 | 31-Mar | 13.2 | 99 |
| Platinum | WWW | 7576 | 62.5 | 32 | 60 | 4-Apr | 13.4 | 96 |
| Q-Max | WWW | 7712 | 60.6 | 39 | 0 | 30-Mar | 14.4 | 99 |
| Topper | WWW | 8175 | 63.8 | 36 | 35 | 1-Apr | 12.9 | 98 |
| D1636 | WWW | 6322 | 61.6 | 36 | 68 | 29-Mar | 14.2 | 98 |
| YU802-175 | WPB | 7031 | 64.2 | 35 | 45 | 2-Apr | 14.3 | 96 |
| YU804-89 | WPB | 6336 | 62.2 | 33 | 65 | 1-Apr | 14.5 | 98 |
| YU803-52 | WPB | 7439 | 63.3 | 33 | 75 | 29-Mar | 15.1 | 96 |
| YU803-54 | WPB | 6990 | 64.0 | 32 | 8 | 29-Mar | 15.3 | 96 |
| ATL-2001 | CIMMYT | 8475 | 63.7 | 38 | 70 | 5-Apr | 13.5 | 98 |
| Turbo | WPB | 7330 | 63.0 | 36 | 68 | 4-Apr | 13.7 | 98 |
| AVERAGE | | 6951 | 62.3 | 35 | 47 | 31-Mar | 14.5 | 98 |

^a Grain yield: LSD (5%) = 538 lbs/acre and cv = 5.5%.