Title: Durum cultivar evaluations for the Western Golden Triangle area of Montana

Principle Investigator: Gadi V.P. Reddy, Superintendent, Western Triangle Ag Research Center

Personnel: John H. Miller, Research Associate and Julie Prewett, Research Assistant, WTARC, Conrad, MT, and Joyce Eckhoff, Research Agronomist, EARC, Sidney, Mt.

Objectives: The objective is to evaluate durum wheat varieties under the local conditions with respect to yield, test weight, plant height, and seed protein. The research center strives to provide growers of the western triangle area unbiased information of various durum wheat varieties.

Methods: The statewide durum nursery consisted of 14 entries replicated three times, seeded with a four row plot seeder on one foot spacing. All plots were planted on no-till chemical fallow. Plots were trimmed, measured for length, and then harvested with a Hege 140 plot combine. Durum wheat seed was cleaned prior to collecting data

Results: Results are tabulated in Tables 1 and 2. Results are presented in Table 1 for the statewide durum nursery and Table 2 is the six year averages for selected varieties in the statewide durum nursery. On station soil test results are reported in Table 3.

Overall, the crop year temperature was close to the 29 year average at the research center with the exception of 2.5 inches less moisture than the 29 year average. The winter temperature was close to average, with the exception of November being 8 degrees cooler than usual. March was 7 degrees warmer than the normal. Also June was 4.6 degrees warmer compared to the 29 year average.

Soil temperatures at the station under chemical fallow stubble stayed under 40 degrees at a depth of eight inches until mid April. May was cool with slightly above average precipitation. Early in June we received 0.95 inches, then it warmed up and remained dry for about 30 days, during that time the durum was running out of water as it was heading. July had normal amounts of rain.

The durum nursery had an average yield of 41.0 bu/ac. The six year average is 67.4 bu/ac. Average test weight for the 2015 growing season was 58.6 lbs/bu, down about 2 lbs/bu from the six year average. Seed protein was about 2.5 % higher for 2015 than the six year average. The top three yielding varieties for 2015 were MT112219, MT112444 and Mountrail at 46.4, 44.0 and 43.7 bu/ac.

No insect incidence (wheat stem sawfly or wireworms) was noticed in any of the durum varieties.

Summary: The data from the statewide durum nursery is supported by the local producers and advisory committee as well as the seed industry. It is planned to continue the durum variety plots at WTARC.

These data should be used for comparative purposes rather than using absolute numbers. Statistics are used to indicate that treatment or variety differences are really different and are not different due to chance or error. The least significant difference (LSD) and coefficient of

variability (CV) values are useful in comparing treatment or variety differences. The LSD value represents the smallest difference between two treatments at a given probably level. The LSD at p=0.05 or 5 % probability level is usually the statistic reported, and it means that the odds are 19 to 1 that treatment differences by the amount of the LSD are truly different. The CV value measures the variability of the experiment or variety trial, and a CV greater than 15 % indicates a high degree of variability and less accuracy.

Funding Summary: Office of Sponsored Projects will provide expenditure information. No other grants support this project.

Table 1. Statewide durum variety trial located at WTARC. Pondera County. Western Triangle Ag. Research Center, 2015.

Variety	Yield bu/ac	Test Weight lb/bu	Plant Height inches	Head Date Julian	Seed Protein %
MT112219	46.4	59.0	24.7	166.7	15.4
MT112444	44.0	57.2	26.7	167.0	15.0
Mountrail	43.7	57.2	33.0	173.0	15.8
Carpio	43.1	57.5	32.7	174.3	15.8
MT112463	42.3	57.8	26.7	167.0	15.3
Joppa	41.9	58.7	34.3	172.0	16.0
MT101694	41.3	59.8	33.0	172.0	16.1
MT112434	40.8	58.3	22.7	166.0	15.8
Silver	39.8	58.6	26.3	166.3	16.4
Alkabo	39.7	58.8	32.3	172.7	15.6
Grenora	39.4	58.2	29.3	172.0	15.9
Tioga	39.4	59.8	33.0	172.3	17.5
MT101717	36.5	61.2	24.7	170.0	15.7
Divide	35.7	58.3	32.3	170.7	17.2
Mean	41.0	58.6	29.3	170.1	16.0
LSD (0.05)	ns	1.5	2.4	0.9	1.0
C.V. (%)	12.7	1.5	4.8	0.3	3.9
P-Value	0.5452	0.0004	<0.0000	<0.0000	0.0032

Planted: April 9, 2015 on chemical fallow barley stubble and harvested on August 3, 2015.
Fertilizer: actual pounds/ac. of N-P-K: 11-22-0 applied with seed and a 172-0-20 blend of urea and potash was broadcast at planting. Fertilizer rates are based on a yield goal of 60 bu/ac.
Herbicide: The plot area was pre-plant sprayed with RT3 at 32 oz/ac on 4/8/2015.
Precipitation for growing season: 4.74 inches.

Table 2. Six-year means, dryland Durum varieties. Western Triangle Ag. Research Center Conrad, MT, Pondera County, 2010 – 2015.

Variety	Source	6 year mean				
		Yield bu/ac	Test weight lbs/bu	Plant Height inches	Heading[1] Date	Seed Protein %
Alkabo	N. Dak.	71.7	60.9	36.9	69.7	13.1
Grenora	N. Dak.	70.7	60.5	34.4	69.3	13.9
Tioga	N. Dak.	63.4	61.1	38.7	70.2	14.0
Silver	MSU	68.8	60.3	27.8	71.2	13.6
Mountrail	N. Dak.	65.1	59.2	37.7	70.8	13.6
Divide	N. Dak.	64.7	60.4	37.7	69.9	13.7
Nursery Mean		67.4	60.4	35.5	70.2	13.6

[1] Heading date is reported as days after planting.

Table 3. Soil test values for on-station plots, 2015.

Location	N (lbs/ac)[1]	Olsen-P (ppm)	K (ppm)	pH	OM (%)	EC (mmhos/cm)
WTARC	15.1	17	375	7.8	2.4	0.47

[1]Nitrogen soil samples were to a depth of four feet in one foot increments. All other soil tests were for zero to six inches in depth.
WTARC- Western Triangle Ag. Research Center