

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

Principle Investigator: Gadi V.P. Reddy, Professor of Entomology/Insect Ecology, Western Triangle Ag Research Center

Personnel: John H. Miller, Research Scientist, Julie Prewett, Research Assistant, WTARC, Conrad, MT, and Mike Giroux and Andrew Hogg, MSU PSPP Dept., Bozeman, MT.

Objectives: The objective is to evaluate durum 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 varieties.

Methods: Plots were seeded with a four row plot seeder on one foot spacing and planted on no-till chemical fallow barley stubble. Plots were trimmed, measured for length, and then harvested with a Wintersteiger Classic plot combine. Durum wheat seed was cleaned prior to collecting data.

Results: Results are tabulated in Tables 1 and 2. Table 3 is the soil test results from each location.

Overall, the crop year temperatures were much warmer than 31 year average at the research center, July was 4.9 degrees warmer than the average. But the overall average temperature for the year from September to August was 1 degree cooler than the 31 year average. The winter temperature was well below average, with the exception of November being about 7 degrees warmer than usual. December and January were 10 and 6 degrees colder than the 31 year average while May thru August were warmer than the 31 year average. July was 5 degrees warmer than the normal. Precipitation was generally above the average from September to April, then below normal from May to August. Overall, precipitation was average for the year.

The durum plots were seeded into soil that had good soil moisture storage from the previous years' fallow period. Overall, considering the lack of moisture and heat this past summer, the durum wheat did quite well.

Durum yields ranged from 56.1 to 43.8 bu/acre (Table 1). With MTD16007, Divide, and MTD16010 being the top three yielding varieties at 56.1, 55.7, and 54.0 bu/ac. The 2017 yields were about 13 bu/ac lower than the five year average (Table 2). Test weights were 2.6 pounds per bushel lighter than the long term average.

Summary: The data from the off station plots is supported by the local producers and advisory committee as well as the seed industry. It is planned to continue the off station variety plots at the same locations as the environmental conditions at each location are unique to the western triangle area. No insect incidence or damage was noticed in any of the varieties.

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 probability 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 Special Projects will provide expenditure information. No other grants support this project.

MWBC FY2018 Grant Submission Plans: A similar project will be proposed for FY 2018. The continuation of on and off-station variety trials help to elucidate researchers and farmers which varieties are better suited for that particular region in Montana.



Table 1. Durum Variety Trial located WTARC. Pondera County. Western Triangle Ag. Research Center. 2017.

Variety	Yield (bu/ac)	Test Wt (lb/bu)	Height (in)	Head Date	Protein (%)	Lodging (%)
MTD16007	56.1	57.8	27.0	174.3	14.7	10.0
Divide	55.7	58.2	28.7	174.3	14.6	5.0
MTD16010	54.0	58.2	29.0	175.0	14.9	11.7
Grenora	53.1	57.0	25.7	172.3	14.4	6.7
MTD16005	52.9	56.5	27.7	173.3	15.1	8.3
Carpio	51.6	56.9	27.0	176.0	14.2	5.7
Tioga	50.5	57.7	31.7	175.7	15.3	6.7
MTD16001	49.6	55.3	26.0	174.3	15.3	5.0
MTD112219	49.5	58.6	22.7	171.0	14.5	4.0
MTD16003	49.2	57.0	26.7	172.3	14.0	10.0
Alkabo	49.0	57.4	26.0	173.0	14.3	8.3
Precision	49.0	57.0	26.7	172.0	15.8	8.3
MTD16004	49.0	58.1	27.7	173.3	13.3	11.7
Dynamic	48.3	57.5	26.3	174.7	14.3	9.0
Mountrail	48.3	55.5	28.7	174.3	14.7	10.0
MTD16009	47.6	53.5	27.3	177.0	15.9	6.7
MTD16011	47.6	55.7	27.3	173.7	15.9	16.7
Joppa	47.3	58.0	26.7	173.3	14.1	11.7
MTD16002	46.3	55.6	29.3	177.3	15.3	6.7
Fortitude	46.1	56.3	26.0	175.0	16.3	3.0
MTD16006	46.1	56.2	27.3	173.0	14.8	6.7
Alzada	46.1	57.6	24.0	171.3	15.1	10.0
MTD16008	45.6	55.5	27.7	174.3	15.1	6.7
Vivid	43.8	56.9	27.0	173.7	15.9	4.0
Mean	49.3	56.8	27.1	173.9	14.9	8.0
LSD (.05)	8.3	1.5	1.8	1.3	1.4	6.3
C.V.	10.3	1.7	4.1	0.5	5.8	47.5
P-Value	0.2768	<0.0000	<0.0000	<0.0000	0.0162	0.0216

Cooperator and Location: WTARC Pondera County.

Planted 4/19/2017 on chemical-fallow barley stubble. Harvested 8/14/2017.

Fertilizer, actual lb/ac: 11-22.5-0 with seed at planting, 208-0-20 broadcast while planting

Herbicide: Sprayed with 11 oz/ac Huskie and 16.4 oz/ac Axial XL on 6/18/2017.

Precipitation: 4.81 inches

¹ Yield and test weight are adjusted to 13% seed moisture.

Conducted by MSU Western Triangle Ag. Research Center.



Table 2. Five-year means, dryland Durum varieties. Western Triangle Ag. Research Center Conrad, MT, Pondera County, 2012 – 2015 and 2017.

Variety	Source	5 year mean				
		Yield (bu/ac)	Test weight (lb/bu)	Height (in)	Head ¹ date	Seed Protein (%)
Alkabo	N. Dak.	65.5	59.8	34.5	70.1	13.7
Alzada	N. Dak.	64.7	59.4	35.5	67.3	13.8
Grenora	N. Dak.	64.1	59.3	64.7	70.1	14.5
Silver	MSU	63.5	59.5	26.7	68.4	14.4
Divide	N. Dak.	61.2	59.7	33.5	69.5	14.4
Mountrail	N. Dak.	69.9	57.9	31.4	71.0	14.4
Tioga	N. Dak.	59.2	60.2	26.7	69.9	14.8
Nursery Mean		62.6	59.4	31.9	69.5	14.3

¹ Days from seeding to heading.

Table 3. Soil test values for off-station and on-station plots, 2017.

Location	N (lb/ac) ¹	Olsen-P (ppm)	K (ppm)	pH	OM (%)	EC (mmhos/cm)
Cut Bank	39.6	17	385	7.5	2.7	0.39
Devon	12.0	14	221	7.2	0.8	0.15
Knees	21.1	28	482	6.9	2.4	0.55
Choteau	44.5	7	412	8.1	2.3	0.82
WTARC Fall	15.5	20	318	7.8	2.6	0.56
WTARC Spring	15.9	30	528	7.4	2.6	0.36
Sweetgrass Hills	3.5	27	336	6.7	2.5	0.23

¹Nitrogen 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

