PROJECT TITLE: Evaluation of regional spring wheat and durum yield trials – 2011(4W2756)

PROJECT LEADER:
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PERSONNEL:
Dr. J. Ohm, North Dakota State University
Dr. E.M. Elias, North Dakota State University

Objectives: To evaluate new and introduced lines and cultivars of spring wheat and durum developed by Universities, the USDA-ARS, and private seed companies, and to determine adaptability of those lines and varieties to conditions in eastern Montana.

METHODS:
Dryland site:
Soil type: Williams clay loam
Previous crops: 2010- safflower, 2009 –fallow, 2008- spring wheat
Residual soil N to 3 ft: 62 lb N/ac
Residual soil P to 6 in: 28 ppm
Applied fertilizer: 80 lb/ac 18-46-0 applied through the drill
Herbicides: Brox M, 1.5 pt/ac and Axial 16 oz/ac , applied June 13
Precipitation April – August, 2011: 12.80 in
Ave (62 yr) precipitation April – August: 9.55 in
Precipitation September 2010 – August 2011:19.62 in
Ave (62 yr) precipitation September – August: 14.06 in

Comments:
It was generally a cool and very wet summer.

Nursery	Planting date	Harvest date
Uniform regional durum trial	Apr 22	Aug 13

RESULTS:
Uniform Regional Hard Red Spring Wheat trial: The Uniform Regional Hard Red Spring wheat was not conducted in 2011.

Uniform Regional Durum trial: The Uniform Regional Durum trial is conducted in cooperation with Dr. E.M. Elias, North Dakota State University, Fargo. Dr. J. Ohm of North Dakota State University, Fargo, tests quality of each line and variety. Thirty-two experimental lines and varieties were tested under dryland recrop conditions (Table 1). Ten experimental lines and varieties yielded significantly more than the check variety, Mountrail. Five-year summaries for yield, test weight, protein, and NIR hardness are shown in Tables 2-5.

SUMMARY: The experiments reported under this project are all of the replicated small plot type. The uniform regional yield trials are conducted at many sites in several states across the western USA, and have been in place since the 1930's. These trials provide important information about experimental lines from state breeding programs, private companies, and the USDA-ARS breeding programs. New varieties are released based on data from these trials.

FUNDING SUMMARY: Expenditure information to be provided by OSP. No other grants support this project.

MWBC FY2012 GRANT SUBMISSION PLANS: It is planned to submit this project for funding consideration in the next fiscal year.

Table 1. Agronomic data obtained from a Uniform Regional durum yield trial grown under dryland fallow conditions at the Eastern Agricultural Research Center, Sidney, MT

Entry	heading*	height, cm	test wt, lb/bu	grain protein, %	NIR hardness	yield, bu/ac	
D06886	59.7	55.7	63.0	13.71	90.2	31.3	a
D07791	59.7	54.3	61.0	14.05	77.6	30.1	a
D071579	58.0	60.0	63.0	13.24	75.1	30.0	a
D06587	59.0	55.7	61.5	13.67	80.6	29.8	a
Tioga	59.3	61.7	62.0	13.32	70.5	29.7	a
D06707	58.7	55.3	61.0	14.22	83.0	29.3	a
D07942	59.3	56.3	61.0	12.90	59.4	29.0	a
Divide	60.0	56.0	61.5	13.73	68.9	28.8	a
D06931	59.0	51.7	59.5	14.50	76.2	28.6	a
D04586	59.7	55.3	61.0	13.18	72.4	28.3	a
D07892	60.0	54.3	60.5	13.46	75.7	28.2	
D071022	58.7	58.0	59.5	13.82	85.0	28.1	
D07667	59.3	50.7	59.5	13.61	66.7	26.7	
D07576	59.7	53.3	61.0	13.89	83.4	26.6	
D07574	59.7	53.3	61.0	14.42	87.3	26.4	
D04581	58.3	54.3	61.5	13.22	59.6	25.9	
D06855	58.7	50.0	61.0	14.42	84.7	25.6	
D06932	58.3	55.0	61.5	13.64	60.7	25.5	
D06710	59.0	49.7	61.0	13.86	82.6	25.2	
D041708(+)	58.0	52.3	59.5	14.50	88.2	24.9	
D07594	59.7	52.3	61.5	13.33	74.5	24.4	
D07726	60.0	54.0	60.0	14.52	74.7	24.0	
D071016	59.7	52.3	59.5	13.43	66.6	23.8	
Mountrail	59.3	52.0	60.5	13.86	88.8	22.9	
D03708	58.0	52.0	59.5	14.32	72.4	22.7	
D03028	59.7	52.7	61.5	13.19	68.6	22.4	
D071023	59.7	54.3	59.0	14.47	87.4	21.8	
D07604	60.0	51.7	59.5	13.86	77.6	21.6	
Alkabo	59.3	54.3	61.5	14.35	87.4	20.9	
D071327	59.0	57.0	61.5	14.32	79.7	20.5	
Grenora	57.7	51.7	61.0	13.36	84.0	20.5	
D071660	58.0	54.3	60.5	13.62	72.0	19.6	
average	59.1	54.1	60.8	13.81	76.9	25.7	
probability	<0.001	0.0425				<0.001	
CV (S/MEAN)	1.0	6.6				12.6	
CV (SE/MEAN)	0.6	3.8				7.3	
LSD (0.05)	1.0	5.8				5.3	

*days from planting
a indicates significantly greater yield than check variety, Mountrail, at probability <0.05

Table 2. Relative yields of durum varieties in bu/ac as compared to Mountraiil when grown in the Uniform Regional Durum trial under dryland fallow conditions at the EARC, Sidney, MT.

Cultivar	2006	2007	2008	2009	2010	Ave	as % of Mountrail
Alkabo	46.4	50.1	33.3	30.7	55.1	43.1	101.8
Grenora	45.7	52.3	31.6	25.7	58.0	42.7	100.8
Divide	41.5	49.2	32.0	32.5	57.7	42.6	100.6
Mountrail	45.7	51.1	30.6	30.4	53.9	42.3	100.0
Tioga	42.7	46.4	32.6	31.8	53.4	41.4	97.7
Lebsock	47.6	44.9	32.5	27.2	52.9	41.0	96.9

NOTE: Average yields in this summary should not be compared to each other since they are not grown in the same years. Compare only to the check variety.

Table 3. Relative test weights of durum varieties in lb/bu as compared to Mountrail when grown in the Uniform Regional Durum trial under dryland fallow conditions at the EARC, Sidney, MT.

Cultivar	2006	2007	2008	2009	2010	Ave	as % of Mountrail
Lebsock	60.8	63.0	59.3	61.8	61.0	61.2	101.8
Alkabo	60.8	62.3	59.2	62.5	60.5	61.1	101.6
Divide	59.8	62.0	59.2	62.2	61.0	60.8	101.2
Tioga	58.8	62.3	59.0	62.7	60.5	60.7	100.9
Grenora	59.0	62.0	58.5	61.5	60.5	60.3	100.3
Mountrail	59.8	61.0	57.5	61.7	60.5	60.1	100.0

NOTE: Average test weights in this summary should not be compared to each other since they are not grown in the same years. Compare only to the check variety.

Table 4. Relative protein contents of durum varieties in percent as compared to Mountrail when grown in the Uniform Regional Durum trial under dryland fallow conditions at the EARC, Sidney, MT.

Cultivar	2006	2007	2008	2009	2010	Ave	as % of Mountrail
Lebsock	13.4	12.0	14.2	15.2	13.3	13.6	101.3
Mountrail	13.1	12.6	15.0	14.5	12.0	13.4	100.0
Grenora	13.3	12.5	14.3	14.9	12.2	13.4	100.0
Tioga	13.9	11.7	14.6	14.5	12.4	13.4	99.9
Alkabo	12.9	12.0	14.4	13.8	12.8	13.2	98.1
Divide	12.9	12.4	14.1	14.4	11.6	13.1	97.3

NOTE: Average protein contents in this summary should not be compared to each other since they are not grown in the same years. Compare only to the check variety.

Table 5. NIR hardness of durum varieties as compared to Mountrail when grown in the Uniform Regional Durum trial under dryland fallow conditions at the EARC, Sidney, Montana.

Cultivar	2006	2007	2008	2009	2010	Ave	as % of Mountrail
Lebsock	63	64	76	108	56	73.4	108.3
Grenora	72	76	81	107	19	71.0	104.7
Tioga	70	57	79	107	27	68.0	100.3
Mountrail	69	73	78	105	14	67.8	100.0
Alkabo	61	63	79	110	17	66.0	97.3
Divide	53	70	77	108	2	62.0	91.4

NOTE: Average protein contents in this summary should not be compared to each other since they are not grown in the same years. Compare only to the check variety.