PROJECT TITLE: Evaluation of regional spring wheat, durum, and oat yield trials - 1998

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

MATERIALS AND METHODS:

All trials had three replications. Plots were 10 ft long and four rows wide with one ft between rows. All rows were harvested with a plot combine for yield, test weight, and grain protein determinations.

Dryland site: Soil type is a Williams loam. The experimental site was fallow in 1997, planted to safflower in 1996, and planted to small grain plots in 1995. Residual soil N was 112 lb/acre to three feet and residual soil P was 46.5 ppm to six inches. Liquid N (28-0-0) was applied at a rate of 20 lb/acre. Soil moisture was good at planting, but the site suffered from dry conditions until early July. Above normal precipitation fell during July, causing secondary tillering. Early varieties did not yield as well in general because rains came to late for them, while late maturing varieties yielded surprisingly well.

Irrigated site: Soil type is Savage silty clay. Previous crops were sugarbeets in 1997, foundation Haybet barley in 1996, and small grain plots in 1995. Residual soil N was 32 lb/acre to four feet, residual soil P was 25 ppm to six inches and residual soil K was 519 ppm to six inches. Granular 18-46-0 was applied at a rate of 300 lb/acre on 29 Oct 1997. Plots were flood irrigated on 4 Jund and 7 July, with approximately three inches of water applied at each irrigation. Bronate was applied 25 May at a rate of 1.5 pt/acre for broadleaf weed control.

Planting and harvest dates were:

Nursery	Planting date	Harvest date
Uniform Regional Hard Red Spring Wheat Trial	20 April	7 August
Uniform Regional Durum Trial – dryland	20 April	11 August
Uniform Regional Durum Trial – irrigated	28 April	12 August
Uniform Regional Oat Trial	17 April	31 July

RESULTS:

Uniform Regional Hard Red Spring Wheat trial: The Uniform Regional Hard Red Spring wheat trial is conducted in cooperation with Dr. G. Linkert of the University of Minnesota, St. Paul. Dr. G. Hareland of North Dakota State University, Fargo, tests quality of each line and variety. Thirty-four experimental lines and varieties of hard red spring wheat were tested under dryland conditions (Table 1). North Dakota lines ND695 and ND706 yielded most followed by AgriPro line N93-0119. Average yield was 57.4 bu/acre. Five-year summaries for yield, test weight, and protein are shown in Tables 2 through 4.

Uniform Regional Durum trial, dryland: The Uniform Regional Durum trial is conducted in cooperation with Dr. E.M. Elias, North Dakota State University, Fargo. Dr. G. Hareland of North Dakota State University, Fargo, tests quality of each line and variety. Thirty-five experimental lines and varieties were tested under dryland fallow conditions (Table 5). North Dakota line D931114 had the highest yield, followed by North Dakota line D941030 and Montrail. Average yield was 56.5 bu/acre. Five-year summaries for yield, test weight, and protein are shown in Tables 6 through 8.

Uniform Regional Durum trial, irrigated: This is the first year to evaluate the Uniform Regional Durum trial under irrigated conditions, although durum varieties have been evaluated under irrigation for many years. Thirty-five experimental lines and varieties were tested under irrigated conditions (Table 9). North Dakota lines D941515, D941276, and D911526 yielded most. Average yield was 61.5 bu/acre. Five-year summaries for yield, test weight, and protein are shown in Tables 10 through 12.

Uniform Regional Oat trial: The Uniform Regional Oat trial is conducted in cooperation with Dr. D. M. Wesenberg of the USDA-ARS National Small Grain Facility, Aberdeen, ID. Thirty experimental lines and varieties were tested (Table 13). North Dakota line ND930122, and Idaho line 86AB4582 yielded most. Average yield was 143.9 bu/acre. Five-year summaries for yield, test weight, and protein are shown in Tables 14 through 16.

SUMMARY: 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.

FUTURE PLANS: New and existing varieties and experimental lines of spring wheat, durum and oat will continue to be tested under dryland and irrigated conditions at the Eastern Agricultural Research Center, so that breeders can release improved varieties and producers can have information on varieties that are adapted to this area. A durum selection and breeding program has been established at EARC in cooperation with the durum breeder from NDSU for development of new varieties adapted to irrigated and dryland conditions in eastern Montana and western North Dakota. New and existing varieties and experimental lines of winter wheat are now being tested under dryland conditions at the Williston Research Center in cooperation with the winter wheat breeder from MSU.

Table 1. Agronomic data obtained from a Uniform Regional hard red spring wheat yield trial grown under dryland fallow conditions at the Eastern Agricultural Research Center, Sidney, MT.
Planting date: 20 April 1998 Harvest date: 7 August 1998

Variety	Days to heading [1]	Height, inches	Protein content	Test wt, lb/bu	Yield bu/acre
ND 695	59	32	15.3	60.2	64.9a
ND 706	58	32	15.4	58.0	63.7a
N93-0119	59	31	15.2	61.0	63.5a
SD 3345	56	36	15.0	61.8	63.5a
2375	57	32	14.6	60.7	62.8a
Keene	60	37	15.0	61.3	62.8a
SD3348	57	33	14.6	59.3	61.4a
MN 95002	56	31	14.5	60.8	61.2a
MN 94200	57	31	14.2	60.0	60.9a
MN 93413	63	33	13.6	56.3	60.7a
N95-0026	57	31	14.9	59.8	59.8a
ND 691	62	34	14.3	57.5	59.7a
SD 3310	56	34	15.4	62.3	59.3a
SD 8119	58	32	14.6	59.8	58.8a
Verde	61	31	14.3	59.2	58.8a
MN 95286	62	32	13.6	60.7	58.6a
WA007802	58	32	13.8	58.3	58.5a
MN 94055	60	32	13.9	59.7	57.3a
N95-0144	58	31	14.1	58.5	57.0a
N95-0264	56	32	13.5	60.5	56.8a
WA 007824	56	31	14.0	60.2	56.3a
RL 4788	58	39	15.7	62.3	54.9a
BW 693	57	36	15.3	59.5	54.8a
ND 694	58	34	16.3	61.2	54.2a
SD 3356	56	31	15.7	60.7	54.1a
BZ987-331	56	32	14.9	58.7	53.7
SWP 96500	58	36	16.2	58.7	53.4
N95-0204	59	31	15.6	58.0	53.0
MT 9609	59	34	15.0	59.7	52.7
N95-0330	60	29	15.6	59.3	52.1
ND 705	60	38	17.8	62.3	51.9
Chris 525-1	62	41	15.5	58.8	48.5
Marquis	64	42	15.4	58.0	44.0
mean	58.5	33.5	14.9	59.8	57.4
CV (S/mean)	0.4	3.8	3.5	1.0	5.6
$LDS_{0.05}$	1.0	2.1	0.9	1.0	5.3

[1] Heading date is number of days from planting

Check variety is Chris with an average yield of 48.5 bu/a.
a indicates significantly greater yield than check variety, Chris, at a probability of <0.05

Table 2. Relative yields of spring wheat varieties as compared to Chris when grown under dryland fallow conditions in the Uniform Regional Hard Red Spring Wheat yield trial at EARC, Sidney Montana.

Cultivar	1994	1995	1996	1997	1998	Ave	as % of Chris
ND 695	--	--	46.6	49.3	64.9	53.6	135.7
HJ98	71.6	32.8	49.6	45.0	--	49.8	132.9
Keene	67.3	38.3	--	--	62.8	56.1	131.4
ND 706	--	--	--	--	63.7	63.7	131.3
2375	--	--	--	--	62.8	62.8	129.5
ND 691	--	--	43.8	48.8	59.7	50.8	128.5
N95-0026	--	--	--	--	59.8	59.8	123.3
N93-0119	--	--	--	41.2	63.5	52.4	122.5
Stoa	58.6	40.7	43.1	40.7	--	45.8	122.3
Scholar	--	--	36.5	48.8	--	42.6	121.9
Era	60.5	39.9	44.8	36.8	--	45.5	121.6
ND 694	--	--	44.6	44.9	54.2	47.9	121.3
Verde	--	--	--	--	58.8	58.8	121.2
Ingot	--	--	35.6	47.4	--	41.5	118.6
N95-0144	--	--	--	--	57.0	57.0	117.5
N95-0264	--	--	--	--	56.8	56.8	117.1
Butte 86	62.0	39.3	41.1	30.4	--	43.2	115.4
N95-0204	--	--	--	--	53.0	53.0	109.3
MT9609	--	--	--	--	52.7	52.7	108.7
N95-0330	--	--	--	--	52.2	52.2	107.6
ND 705	--	--	--	--	51.9	51.9	107.0
Sharpshooter	--	--	41.6	33.2	--	37.4	106.9
Chris 525-1	47.5	32.2	33.0	37.0	48.5	39.6	100.0
BZ987-331				31.6	53.7	42.6	99.8
Marquis	47.1	19.7	30.9	31.6	44.0	34.7	87.4

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

Table 3. Relative test weights of spring wheat varieties as compared to Chris when grown under dryland fallow conditions in the Uniform Regional Hard Red Spring Wheat yield trial at EARC, Sidney Montana.

Cultivar	1994	1995	1996	1997	1998	Ave	as % of Chris
ND 705	--	--	--	--	62.3	62.3	105.9
Ingot	--	--	62.9	64.2	--	63.6	105.6
Sharpshooter	--	--	64.0	62.7	--	63.4	105.2
ND 694	--	--	63.2	61.0	61.2	61.8	103.5
2375	--	--	--	--	60.7	60.7	103.2
N93-0119	--	--	--	60.0	61.0	60.5	102.9
N95-0264	--	--	--	--	60.5	60.5	102.9
ND 695	--	--	63.2	60.8	60.2	61.4	102.8
Keene	62.0	61.5	--	--	61.3	61.6	102.5
Scholar	--	--	62.2	61.0	--	61.6	102.3
N95-0026	--	--	--	--	59.8	59.8	101.7
MT9609	--	--	--	--	59.7	59.7	101.5
Butte 86	61.4	61.6	62.2	60.1	--	61.3	101.4
HJ98	61.8	61.4	61.8	59.0	--	61.0	100.9
N95-0330	--	--	--	--	59.3	59.3	100.9
Verde	--	--	--	--	59.2	59.2	100.7
Marquis	60.2	61.4	61.5	59.9	58.0	60.2	100.1
Chris 525-1	60.3	61.2	61.6	58.8	58.8	60.1	100.0
BZ987-331				58.7	58.7	58.7	99.8
Era	59.6	60.8	61.3	59.5	--	60.3	99.7
N95-0144	--	--	--	--	58.5	58.5	99.5
Stoa	60.0	60.8	61.3	58.3	--	60.1	99.4
ND 691	--	--	60.8	59.7	57.5	59.3	99.3
ND 706	--	--	--	--	58.0	58.0	98.6
N95-0204	--	--	--	--	58.0	58.0	98.6

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

Table 4. Relative protein contents of spring wheat varieties as compared to Chris when grown under dryland fallow conditions in the Uniform Regional Hard Red Spring Wheat yield trial at EARC, Sidney Montana.

Cultivar	1994	1995	1996	1997	1998	Ave	as % of Chris
ND 705	--	--	--	--	17.8	17.80	114.8
ND 694	--	--	13.3	15.7	16.3	15.10	101.1
N95-0204	--	--	--	--	15.6	15.60	100.6
N95-0330	--	--	--	--	15.6	15.60	100.6
Chris 525-1	13.7	14.7	13.3	16.0	15.5	14.64	100.0
Ingot	--	--	16.5	12.8	--	14.65	100.0
BZ987-331	--	--	--	16.5	14.9	15.70	99.7
ND 706	--	--	--	--	15.4	15.40	99.4
Marquis	13.4	15.2	13.0	15.4	15.4	14.48	98.9
Keene	13.8	14.6	--	--	15.0	14.47	98.9
Sharpshooter	--	--	12.8	16.0	--	14.40	98.3
N93-0119	--	--	--	15.7	15.2	15.45	98.1
MT9609	--	--	--	--	15.0	15.00	96.8
N95-0026	--	--	--	--	14.9	14.90	96.1
Stoa	13.1	14.1	12.7	15.4	--	13.83	95.8
Butte 86	12.9	14.5	11.9	16.0	--	13.83	95.8
ND 695	--	--	12.3	14.7	15.3	14.10	94.4
Scholar	--	--	12.8	14.8	--	13.80	94.2
2375	--	--	--	--	14.6	14.60	94.2
HJ98	11.9	14.2	12.6	15.4	--	13.52	93.8
Verde	--	--	--	--	14.3	14.30	92.3
ND 691	--	--	12.2	14.8	14.3	13.77	92.2
N95-0144	--	--	--	--	14.1	14.10	91.0
Era	11.3	13.5	12.2	15.2	--	13.05	90.5
N95-0264	--	--	--	--	13.5	13.50	87.1

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

Table 5. Agronomic data obtained from a Uniform Regional durum yield trial grown under dryland fallow conditions at the Eastern Agricultural Research Center, Sidney, MT.
Planting date: 20 April 1998 Harvest date: 11 August 1998

Variety	Days to heading [1]	Height, inches	Protein content	Test wt, lb/bu	Yield bu/acre
D931114	61	28	13.3	61.3	63.4
D941030	62	33	14.2	60.5	63.1
Montrail	62	32	14.3	59.7	61.2
D941261	63	31	15.0	60.2	61.1
D941514	59	33	13.0	61.0	60.8
D941033	62	30	13.7	60.2	60.6
D911526	61	30	13.9	59.6	61.3
D91080	64	27	14.0	60.0	59.3
D941256	62	31	13.9	60.2	59.3
D901297	62	32	14.6	60.2	59.3
Renville	61	34	14.3	59.8	59.1
D941276	62	31	14.0	59.3	59.0
D901518	62	29	13.8	58.8	58.4
D901442	60	30	14.0	61.2	58.1
D941038	61	31	14.4	60.8	57.9
D91058	61	30	14.3	60.2	57.9
Belzer	61	34	14.5	58.7	57.4
Rugby	60	34	14.2	60.5	56.1
D941515	59	31	13.5	60.7	55.4
D940098	61	27	13.4	62.2	55.2
Munich	59	28	15.0	58.7	54.9
D91066	61	31	15.0	60.0	54.5
Vic	60	34	14.1	61.0	54.2
Ben	60	32	14.5	60.2	54.0
D940027	61	29	13.6	61.2	53.9
D941229	61	30	14.0	61.2	52.7
Kari	61	29	14.6	59.8	52.6
Medora	60	32	14.7	60.0	52.5
Monroe	58	31	14.0	60.3	52.3x
AC Morse	59	29	14.3	59.5	51.7x
AC Melita	60	32	14.5	59.8	51.4x
Lloyd	62	25	14.4	58.7	51.3x
Mindum	65	43	14.5	60.8	50.9x
D941051	59	32	14.4	60.2	50.1x
mean	60.8	31.0	14.2	60.3	56.5
CV (S/mean)	1.5	4.8	4.2	1.0	7.2
$LDS_{0.05}$	1.5	2.4	1.0	1.0	6.6

[1] Heading date is number of days from planting
Check variety is Renville with an average yield of 59.1 bu/a.
x indicates significantly lower yield than check variety, Renville, at a probability of <0.05

Table 6. Relative yields of durum varieties as compared to Renville when grown under dryland fallow conditions at the EARC, Sidney, Montana.

Cultivar	1994	1995	1996	1997[1]	1997[2]	1998	Ave	as % of Renville
D931114	--	--	--	42.0	--	63.4	52.7	115.1
Montrail	68.3	57.6	40.2	36.2	--	61.2	52.7	105.2
D91080	--	52.2	39.6	39.9	--	59.3	47.8	103.9
D901442	68.3	51.6	38.2	35.1	--	58.1	50.3	100.3
Renville	66.6	55.3	37.0	32.5	34.7	59.1	47.5	100.0
Maier	60.3	49.0	41.1	37.9	--	59.6	49.6	99.0
Dressler	--	--	37.9	--	33.1	--	35.5	99.0
Ben	62.0	48.3	39.5	40.6	34.7	54.0	46.5	97.9
Belzer	64.2	50.0	35.7	36.9	--	57.4	48.8	97.5
D901518	53.8	50.4	40.5	35.9	--	58.4	47.8	95.4
Munich	61.8	50.6	39.2	33.8	30.3	54.9	45.1	94.9
Lloyd	62.0	50.9	40.8	31.2	--	51.3	47.2	94.3
Vic	61.6	47.3	37.2	34.6	--	54.2	47.0	93.8
Voss	--	--	--	--	32.4	--	32.4	93.4
Rugby	57.7	52.0	36.0	31.0	--	56.1	46.6	92.9
Medora	60.4	41.2	37.3	37.5	--	52.5	45.8	91.4
Kyle	58.0	48.3	38.2	--	--	--	48.2	90.9
Kari	--	--	--	--	31.1	52.6	41.8	89.2
Monroe	59.2	45.5	39.7	26.5	--	52.3	44.6	89.1
Mindum	55.5	42.0	34.2	38.3	--	50.9	44.2	88.2
Plenty	59.2	43.1	36.7	--	--	--	46.3	87.5
AC Morse	--	--	--	--	--	51.7	51.7	87.5
AC Melita	--	--	--	--	30.4	51.4	40.9	86.8

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

[1]Uniform regional durum trial
[2]Commercial dryland durum trial

Table 7. Relative test weights of durum varieties as compared to Renville when grown under dryland fallow conditions at the EARC, Sidney, Montana.

Cultivar	1994	1995	1996	1997[1]	1997[2]	1998	Ave	as % of Renville
Voss	--	--	--	--	62.4	--	62.4	103.0
Mindum	62.4	63.8	64.3	62.6	--	60.8	62.8	102.2
D901442	62.7	63.2	64.2	61.2	--	61.2	62.5	101.7
Rugby	62.1	62.7	63.3	62.3	--	60.5	62.2	101.2
Ben	63.0	62.7	62.8	60.9	62.2	60.2	62.0	101.1
Vic	62.4	62.6	63.2	60.8	--	61.0	62.0	100.9
Kari	--	--	--	--	61.7	59.8	60.8	100.9
Maier	62.5	62.2	63.6	60.2	--	61.0	61.9	100.7
D931114	--	--	--	60.5	--	61.3	60.9	100.5
Medora	61.7	62.3	63.9	60.0	--	60.0	61.6	100.2
Renville	61.4	62.3	62.3	61.4	60.6	59.8	61.3	100.0
Munich	63.2	62.2	61.9	61.2	60.6	58.7	61.3	100.0
Dressler	--	--	62.2	--	60.6	--	61.9	99.9
Monroe	61.1	62.0	63.0	60.1	--	60.3	61.3	99.8
D91080	--	62.8	62.4	59.8	--	60.0	61.2	99.7
AC Melita	--	--	--	--	60.0	59.8	59.9	99.5
Kyle	60.6	62.5	62.0	--	--	--	61.7	99.5
AC Morse	--	--	--	--	--	59.5	59.5	99.5
Plenty	61.0	62.0	61.9	--	--	--	61.6	99.4
Montrail	61.0	62.2	62.3	60.0	--	59.7	61.0	99.3
D901518	61.2	61.7	62.0	60.7	--	58.8	60.9	99.1
Belzer	61.5	61.7	61.1	57.8	--	58.7	60.2	97.9
Lloyd	59.2	61.0	61.7	59.0	--	58.7	59.9	97.5

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

[1]Uniform regional durum trial
[2]Commercial dryland durum trial

Table 8. Relative protein contents of durum varieties as compared to Renville when grown under dryland fallow conditions at the EARC, Sidney, Montana.

Cultivar	1994	1995	1996	1997[1]	1997[2]	1998	Ave	as % of Renville
Kyle	12.4	16.3	12.0	--	--	--	13.57	108.8
Plenty	11.8	15.8	12.6	--	--	--	13.40	107.5
Monroe	12.2	16.2	12.0	15.3	--	14.0	13.94	103.9
Rugby	12.7	15.2	12.2	15.4	--	14.2	13.94	103.9
Vic	12.4	14.9	12.8	14.8	--	14.1	13.80	102.8
Medora	12.5	14.4	11.8	15.5	--	14.7	13.78	102.7
Munich	11.6	13.7	12.2	15.1	15.2	15.0	13.80	100.6
Renville	11.2	13.8	12.4	15.4	15.2	14.3	13.72	100.0
Ben	11.8	14.2	12.7	14.5	14.6	14.5	13.72	100.0
AC Morse	--	--	--	--	--	14.3	14.30	100.0
Maier	11.6	14.0	11.4	15.3	--	14.7	13.40	99.9
D901442	12.0	14.7	11.6	14.4	--	14.0	13.34	99.4
Dressler	--	--	12.2	--	15.2	--	13.70	99.3
Belzer	11.3	14.1	12.4	14.2	--	14.5	13.30	99.1
Lloyd	12.4	15.1	10.4	13.7	--	14.4	13.20	98.4
AC Melita	--	--	--	--	14.5	14.5	14.50	98.3
Mindum	11.0	14.8	11.2	14.4	--	14.5	13.18	98.2
Kari	--	--	--	--	14.3	14.6	14.45	98.0
Montrail	11.5	14.0	11.4	14.5	--	14.3	13.14	97.9
D91080	--	14.8	10.8	14.0	--	14.0	13.40	95.9
Voss	--	--	--	--	14.4	--	14.40	94.7
D901518	9.0	15.6	10.8	14.0	--	13.8	12.64	94.2
D931114	--	--	--	14.0	--	13.3	13.65	91.9

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, Renville.

[1]Uniform regional durum trial
[2]Commercial dryland durum trial

Table 9. Agronomic data obtained from a Uniform Regional durum yield trial grown under flood irrigated conditions at the Eastern Agricultural Research Center, Sidney, MT.
Planting date: 28 April 1998 Harvest date: 12 August 1998

Variety	Days to heading [1]	Height, inches	Protein content	Test wt, lb/bu	Yield bu/acre
D941515	58	35	12.4	62.8	77.5a
D941276	62	33	12.6	62.2	73.2a
D911526	60	34	12.8	62.2	73.0a
D941030	61	36	13.0	62.5	66.9
D901297	61	34	13.1	61.7	66.7
Montrail	61	34	13.4	62.2	65.9
AC Morse	58	33	12.7	61.2	65.8
Ben	60	34	13.2	62.5	65.0
Belzer	63	36	12.7	61.3	64.8
Munich	60	31	13.3	61.2	64.6
Rugby	60	37	13.2	62.7	64.4
D941038	62	34	12.5	62.5	64.0
D901442	59	33	12.7	62.5	63.5
D91080	61	28	13.2	62.8	63.5
Maier	62	32	13.5	61.8	63.4
D941261	60	34	12.8	62.5	62.9
D91058	60	32	13.3	60.8	62.8
AC Melita	57	40	12.3	61.2	62.0
D941256	60	35	13.1	61.5	61.6
Renville	59	36	13.0	62.0	60.8
D911066	61	33	12.8	62.3	60.3
Kari	59	33	12.8	61.5	60.1
D940098	61	29	12.1	63.3	60.1
D940027	60	30	12.7	61.5	59.6
D941051	60	36	13.0	62.3	59.0
D941514	60	36	12.3	62.3	58.4
Mindum	62	45	12.5	64.2	58.0
D941033	62	33	12.2	61.7	58.0
Vic	58	36	12.4	62.2	56.0
D941229	59	34	12.0	62.0	55.8
D931114	61	28	12.6	62.2	55.2
Medora	60	37	13.0	61.5	52.4
D901518	63	30	13.0	61.3	52.2
Monroe	56	34	12.6	60.5	52.2
Lloyd	61	26	13.1	58.3	47.9x
mean	60.3	33.7	12.8	61.9	61.5
CV (S/mean)	2.7	5.6	4.0	1.4	11.9
$LDS_{0.05}$	2.6	3.1	0.8	1.4	12.0

[1] Heading date is number of days from planting
Check variety is Renville with an average yield of 60.8 bu/a.
a indicates significantly greater yield than check variety, Renville, at a probability of <0.05
x indicates significantly lower yield than check variety, Renville, at a probability of <0.05

Table 10. Relative yields of durum varieties compared to Renville when grown under irrigated conditions at the EARC, Sidney, Montana.

Cultivar	1994	1995	1996	1997[1]	1997[2]	1998	Ave	as % of Renville
Montrail	--	--	--	--	--	65.9	65.9	108.4
AC Morse	--	--	--	--	--	65.8	65.8	108.2
Belzer	--	--	--	--	--	64.8	64.8	106.6
Rugby	--	--	--	--	--	64.4	64.4	105.9
Maier	--	--	--	--	--	63.4	63.4	104.3
Dressler	--	--	101.4	71.7	60.2	--	77.8	102.1
Kari	--	--	--	--	61.2	60.1	60.6	100.8
Munich	--	73.2	95.7	64.5	56.0	64.6	70.8	100.2
Renville	91.5	67.2	96.6	72.3	59.5	60.8	74.6	100.0
AC Melita	--	--	--	--	57.8	62.0	59.9	99.6
Ben	--	--	96.8	66.6	54.9	65.0	70.8	98.0
Kyle	89.8	63.9	90.4	77.5	--	--	80.4	97.8
Mindum	--	--	--	--	--	58.5	58.5	95.3
Voss	--	72.0	99.2	59.8	48.8	--	70.0	94.7
Plenty	87.6	66.7	87.5	67.5	--	--	77.3	94.4
Vic	83.1	67.6	85.0	68.4	--	56.0	72.0	92.7
Medora	85.1	70.3	86.8	63.1	--	52.4	71.5	92.1
Monroe	65.0	67.5	83.8	59.6	--	52.2	65.6	84.5
Lloyd	64.7	--	92.2	56.9	--	47.9	65.4	81.5

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

[1]Statewide irrigated durum trial
[2]Commercial irrigated durum trial

Table 11. Relative test weights of durum varieties compared to Renville when grown under irrigated conditions at the EARC, Sidney, Montana.

Cultivar	1994	1995	1996	1997[1]	1997[2]	1998	Ave	as % of Renville
Mindum	--	--	--	--	--	64.2	64.2	103.5
Dressler	--	--	63.8	62.2	62.3	--	62.8	101.5
Ben	--	--	63.6	62.2	62.0	62.5	62.6	101.1
Rugby	--	--	--	--	--	62.7	62.7	101.1
Medora	63.0	58.0	63.1	61.8	--	61.5	61.5	100.3
Montrail	--	--	--	--	--	62.2	62.2	100.3
Munich	--	59.0	63.1	61.3	61.5	61.2	61.2	100.2
Plenty	62.7	58.0	63.0	61.3	--	--	61.2	100.2
Renville	62.5	58.0	62.8	61.3	61.5	62.0	61.4	100.0
Vic	62.8	57.7	63.0	60.8	--	62.2	61.3	100.0
Maier	--	--	--	--	--	61.8	61.8	99.7
Kari	--	--	--	--	61.0	61.5	61.2	99.2
Voss	--	57.5	62.8	59.5	61.7	--	60.4	99.1
Kyle	63.0	57.5	61.6	60.2	--	--	60.6	99.1
Monroe	61.0	57.5	63.0	61.2	--	60.5	60.6	98.9
Belzer	--	--	--	--	--	61.3	61.3	98.9
AC Melita	--	--	--	--	60.8	61.2	61.0	98.8
AC Morse	--	--	--	--	--	61.2	61.2	98.7
Lloyd	58.7	--	63.0	61.0	--	58.3	60.2	96.9

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

[1]Statewide irrigated durum trial
[2]Commercial irrigated durum trial

Table 12. Relative proteins of durum varieties compared to Renville when grown under irrigated conditions at the EARC, Sidney, Montana.

Cultivar	1994	1995	1996	1997[1]	1997[2]	1998	Ave	as % of Renville
Maier	--	--	--	--	--	13.5	13.50	103.8
Montrail	--	--	--	--	--	13.4	13.40	103.1
Rugby	--	--	--	--	--	13.2	13.20	101.5
Dressler	--	--	13.3	11.6	11.2	--	12.03	100.6
Kyle	14.7	16.8	13.7	10.0	--	--	13.80	100.4
Ben	--	--	13.3	11.0	11.5	13.2	12.25	100.2
Renville	13.9	16.1	13.9	10.9	11.1	13.0	13.15	100.0
Medora	14.4	15.6	13.6	11.1	--	13.0	13.54	99.9
Kari	--	--	--	--	11.2	12.8	12.00	99.6
AC Melita	--	--	--	--	11.5	12.3	11.90	98.8
Monroe	14.6	15.6	13.0	11.0	--	12.6	13.36	98.5
AC Morse	--	--	--	--	--	12.7	12.70	97.7
Belzer	--	--	--	--	--	12.7	12.70	97.7
Plenty	14.0	15.6	13.8	10.1	--	--	13.38	97.6
Munich	--	15.0	12.8	10.9	11.0	13.3	12.60	96.9
Mindum	--	--	--	--	--	12.5	12.50	96.2
Vic	14.3	14.9	13.2	10.3	--	12.4	13.02	96.0
Lloyd	13.8	--	11.9	10.8	--	13.1	12.40	95.9
Voss	--	15.5	11.8	10.6	10.8	--	12.18	93.7

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

[1]Statewide irrigated durum trial
[2]Commercial irrigated durum trial

Table 13. Agronomic data obtained from a dryland Uniform Regional oat yield trial grown under dryland fallow conditions at the Eastern Agricultural Research Center, Sidney, MT.
Planting date: 17 April 1998 Harvest date: 31 July 1998

Variety	Days to heading [1]	Height, inches	Protein content	Test wt, lb/bu	Yield bu/acre	
ND930122	61	34	11.0	34.0	153.8	
86AB4582	63	35	11.2	32.3	153.3	
Whitestone	65	35	10.9	33.2	151.2	
Monida	66	36	11.8	29.3	151.2	
95A12743	63	30	11.7	29.5	150.4	
82AB248	67	31	12.1	29.8	148.3	
87AB5125	65	30	11.2	30.7	148.2	
Cayuse	64	35	11.7	30.5	148.0	
Otana	65	38	11.8	33.3	147.6	
ABSP 19-9	65	33	11.5	33.2	147.2	
Prairie	60	33	11.0	32.3	146.9	
ABSP 9-2	62	33	12.0	33.5	146.6	
91AB406	63	30	12.1	30.2	145.6	
ND860416	66	38	11.4	32.7	145.4	
CDC Boyer	66	38	12.0	31.2	144.1	
91AB502	59	30	11.8	32.2	144.0	
90AB1322	64	30	11.4	29.7	144.0	
ND910569	63	33	11.9	33.2	143.6	
89AB4088	61	34	12.6	34.2	142.9	
86AB664	65	34	11.1	29.8	142.6	
IAH613-3	64	38	11.3	29.2	140.9	
Rio Grande	61	32	12.2	32.7	140.7	
84AB825	65	32	11.9	29.2	139.5	
Celcia	67	38	11.0	29.7	138.1	x
Powell	66	30	11.8	29.5	136.8	x
Ogle	59	32	11.6	32.0	136.8	x
Ajay	63	26	12.2	31.5	136.5	x
CDC Pacer	65	37	11.4	31.7	134.9	x
Derby	65	40	11.3	31.5	134.3	x
87AB4983	59	28	11.3	34.3	133.0	x
mean	63.6	33.4	11.60	31.5	143.9	
CV (S/mean)	0.5	3.1	3.9	2.1	3.6	
$LDS_{0.05}$	1.3	1.7	0.7	1.1	8.6	

[1] Heading date is number of days from planting

Check variety is Otana with an average yield of 147.6 bu/a.
x indicates significantly lower yield than check variety, Otana, at a probability of <0.05

Table 14. Relative yields of oat varieties as compared to Otana when grown under dryland fallow conditions at the EARC, Sidney, Montana.

Cultivar	1994	1995	1996	1997	1998	Ave	as % of Otana
Monida	131.1	129.4	84.2	120.7	151.2	123.3	110.2
ABSP9-2	--	--	81.8	134.4	146.6	120.9	110.0
ND860416	120.1	116.4	85.0	141.6	145.4	121.7	108.8
Whitestone	125.4	124.2	73.3	131.7	153.3	121.6	108.7
ABSP 19-9	--	--	--	124.8	147.2	136.0	106.0
Powell	126.2	119.2	81.3	127.5	136.8	118.2	105.6
CDC Boyer	--	--	--	121.2	144.1	132.6	103.4
Celsia	--	110.6	76.1	131.0	138.1	114.0	102.7
Newdak	116.3	116.6	69.6	118.7	--	105.3	102.3
Rio Grande	129.6	119.5	76.4	101.7	140.7	113.6	101.5
Cayuse	109.2	113.8	79.1	115.9	148.0	113.2	101.2
Prairie	--	115.1	80.7	106.3	146.9	112.2	101.1
Ajay	126.9	105.4	74.8	119.4	136.5	112.6	100.6
Otana	115.4	114.1	73.4	108.9	147.6	111.9	100.0
CDC Pacer	--	--	--	118.6	134.9	126.8	98.8
Ogle	112.6	104.9	71.1	105.6	136.8	106.2	94.9
Derby	89.6	95.4	82.6	127.8	134.3	105.9	94.7

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

Table 15. Relative test weights of oat varieties as compared to Otana when grown under dryland fallow conditions at the EARC, Sidney, Montana.

Cultivar	1994	1995	1996	1997	1998	Ave	as % of Otana
Otana	43.3	38.2	36.7	34.8	33.3	37.3	100.0
ABSP 19-9	--	--	--	34.2	33.2	33.7	99.0
ABSP9-2	--	--	34.4	35.0	33.5	34.3	98.2
ND860416	41.8	37.3	36.4	33.7	32.7	36.4	97.6
Derby	43.0	38.0	34.9	33.0	31.5	36.1	96.8
Whitestone	43.0	38.2	32.5	33.5	33.2	36.1	96.8
CDC Pacer	--	--	--	33.7	31.7	32.7	96.0
Monida	42.3	37.8	35.4	33.2	29.3	35.6	95.4
Ogle	42.3	36.8	32.9	30.8	32.0	35.0	93.8
Rio Grande	41.8	36.8	31.8	32.0	32.7	35.0	93.8
Newdak	41.3	35.5	34.2	32.2	--	35.8	93.6
Ajay	38.7	36.8	33.8	33.0	31.5	34.8	93.3
Prairie	--	36.3	32.6	32.2	32.3	33.4	93.3
Celsia	--	36.5	32.7	32.3	29.7	32.8	91.7
CDC Boyer	--	--	--	31.0	31.2	31.1	91.3
Powell	39.5	36.2	30.4	32.0	29.5	33.5	89.8
Cayuse	40.5	35.3	29.6	30.8	30.5	33.3	89.3

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

Table 16. Relative protein contents of oat varieties as compared to Otana when grown under dryland fallow conditions at the EARC, Sidney, Montana.

Cultivar	1994	1995	1996	1997	1998	Ave	as % of Otana
Ajay	11.4	14.3	10.5	14.0	12.2	12.48	104.0
Newdak	11.3	14.0	10.0	13.8	--	12.28	101.9
Rio Grande	11.2	13.5	10.2	13.8	12.2	12.18	101.5
Otana	10.9	14.3	9.3	13.7	11.8	12.00	100.0
CDC Boyer	--	--	--	13.2	12.0	12.60	98.8
ABSP 19-9				13.7	11.5	12.60	98.8
Prairie	--	14.2	9.7	13.4	11.0	12.08	98.4
ABSP9-2	--	--	9.6	12.6	12.0	11.40	98.3
Ogle	11.1	14.0	8.5	13.6	11.6	11.76	98.0
Cayuse	10.4	13.1	9.7	13.0	11.7	11.58	96.5
Derby	10.9	13.8	9.0	12.8	11.3	11.56	96.3
CDC Pacer	--	--	-	13.0	11.4	12.20	95.7
ND860416	10.4	13.6	9.0	12.6	11.4	11.40	95.0
Whitestone	10.5	13.1	9.4	12.9	10.9	11.36	94.7
Monida	9.5	13.4	9.0	13.1	11.8	11.36	94.7
Powell	9.4	12.7	9.3	13.6	11.8	11.36	94.7
Celsia	--	13.2	9.2	12.5	11.0	11.48	93.5

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