PROJECT TITLE: Evaluation of regional spring wheat, winter wheat, durum, and oat yield trials.

PROJECT LEADERS: Joyce L.A. Eckhoff
Jerald W. Bergman
Eastern Agricultural Research Center
Sidney, MT 59270

PROJECT PERSONNEL: Dr. R.H. Busch, University of Minnesota
Dr. C.J. Peterson, University of Nebraska
Dr. E.M. Elias, North Dakota State University
Dr. D.M. Wesenberg, USDA National Small Grain Facility, Aberdeen, Idaho

OBJECTIVE:

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

RESULTS:

Uniform Regional Hard Red Spring Wheat Yield Trial

The Uniform Regional Hard Red Spring Wheat trial is conducted in cooperation with Dr. R.H. Busch of the University of Minnesota, St. Paul. Thirty-two varieties and experimental lines were evaluated in the 1994 regional spring wheat yield trial (Table 1). The highest yielding line was SBE0050. Average yield of the nursery was 61.5 bu/acre. Relative yields, test weights, and protein contents of varieties grown in this trial are shown in Tables 2 through 4.

Uniform Regional Durum Yield Trial

The Uniform Regional Durum trial is conducted in cooperation with Dr. E.M. Elias of North Dakota State University, Fargo. Thirty-four varieties and experimental lines were evaluated in 1993 (Table 5). The highest yielding line was North Dakota line D901313. Average yield was 61.5 bu/acre. Relative yields, test weights, and protein contents are shown in Tables 6 through 8.

Northern Regional Winter Wheat Yield Trial

The Northern Regional Winter Wheat trial is conducted in cooperation with Dr. C.J. Peterson of the University of Nebraska, Lincoln. Twenty-nine varieties and experimental lines were evaluated in 1993-94 (Table 9). The highest yielding line was an F_1 hybrid from Hybritech, XNH-1. Average grain yield was 56.0 bu/acre. Relative yields, test weights, and protein contents are shown in Tables 10 through 12.

Uniform Regional Oat Yield 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-nine varieties and experimental lines were evaluated (Table 13.) The highest yielding was Idaho line 87AB5125. Average yield was 111.8 bu/acre. Relative yields, test weights, and protein contents are shown in Tables 14 through 16.

SUMMARY:

The regional yield trials were conducted under dryland conditions at the Eastern Agricultural Research Center in Sidney. Good soil moisture at planting with timely rainfall and moderate temperatures during the growing season resulted in very good yields.

FUTURE PLANS:

New and existing varieties and experimental lines will continue to be evaluated at the Eastern Agricultural Research Center so that breeders can release improved varieties and producers can have information on the varieties that are best adapted to conditions in this area.

Table 1 Agronomic data obtained from a dryland uniform regional hard red spring wheat yield trial conducted at the Eastern Agricultural Research Center, Sidney, Montana, 1994.

Date Seeded: April 21, 1994 Date Harvested: August 10, 1994 Plot Size: 40 Sq. Ft.[1/]

Variety	Average Days to Heading[2/]	Average Height Inches	Average Protein Content %	Average Test Wt. Lbs/Bu	Average Yield Bu/Acre
SBE0050	63	32	11.9	61.8	71.6 aa
SD 10	59	30	12.6	61.5	69.6 aa
ND 686	61	34	12.5	61.5	68.1 aa
N91-3057	64	32	11.4	58.2	67.9 aa
ND 678	62	40	13.8	62.0	67.3 aa
N90-0666	62	31	13.1	61.1	67.1 aa
N90-0671	64	28	12.3	59.0	66.7 aa
SD 14	61	31	12.4	60.6	65.9 aa
MN91309	60	32	12.7	61.6	64.4 aa
N91-0059	64	29	12.7	59.6	64.1 aa
MN91277	64	31	13.3	60.3	63.4 aa
SD 7	65	31	11.9	61.0	63.3 aa
N90-0392	62	31	12.4	61.3	62.9 aa
MN91324	61	32	11.7	61.8	62.6 aa
SBE0437	65	33	12.7	59.6	62.2 aa
ND 674	61	35	13.9	61.2	62.1 aa
N89-0562	63	29	14.1	61.2	62.1 aa
MN92006	61	30	12.5	62.8	62.1 aa
Butte86	61	35	12.9	61.4	62.1 aa
SD 3151	59	33	14.1	62.4	61.8 aa

(Continued)

Table 1 (Continued) Agronomic data obtained from a dryland uniform regional hard red spring wheat yield trial conducted at the Eastern Agricultural Research Center, Sidney, Montana, 1994.

Date Seeded: April 21, 1994 Date Harvested: August 10, 1994 Plot Size: 40 Sq. Ft.

Variety	Average Days to Heading[2]	Average Height Inches	Average Protein Content %	Average Test Wt. Lbs/Bu	Average Yield Bu/Acre
Era	66	31	11.3	59.6	60.5 aa
SD 3156	58	33	12.6	62.4	60.3 aa
MN90138	62	31	12.3	60.9	60.2 aa
N90-0700	60	31	13.0	61.1	59.5 aa
ND 673	62	40	13.8	59.7	58.6 aa
Stoa	63	38	13.1	60.0	58.6 aa
BW 173	64	39	11.3	60.6	57.9 a
BW 174	64	37	12.4	60.0	55.5
ND 677	63	37	13.2	61.3	53.3
BW 688	65	39	13.9	59.7	52.8
Chris, 525-1	65	42	13.7	60.3	47.5
Marquis	68	44	13.4	60.2	47.1
Mean	63	34	12.8	60.8	61.5
F-Value	36.49	36.39	4.17	8.84	3.79
SE of the mean	0.36	0.69	0.39	0.35	2.94
LSD (0.05)	1.03	1.96	1.10	1.00	8.31
LSD (0.01)	--	--	--	--	11.05
CV (SE/Mean)	0.58	2.05	3.04	0.58	4.77
CV (s/Mean)	1.01	3.56	5.27	1.01	8.27

(Continued)

Table 1 (Continued) Agronomic data obtained from a dryland uniform regional hard spring wheat yield trial conducted at the Eastern Agricultural Research Center, Sidney, Montana, 1994.

1/ 4 row plots, rows 10 ft. long and 1.0 ft. apart. At harvest the two center rows were taken for yield, test weight, and protein determinations.

2/ Heading date is the number of days from planting date.

Chris is the check variety with an average yield of 47.5 Bu/Acre.

aa Indicates a significantly greater yield than check Chris at the 0.01 level of significance.
a Indicates a significantly greater yield than check Chris at the 0.05 level of significance.

Previous crop: Summer fallow Soil type: Williams Loam

Residual soil P: 39 lbs/acre to 6 inches.

Residual soil N: 0 - 1 ft. 30 lbs/a. 2 - 3 ft. 23 lbs/a.
1 - 2 ft. 27 lbs/a. 3 - 4 ft. 20 lbs/a.

Fertilizer: 30 lbs/a of N as 28-0-0 liquid nitrogen was applied on November 10, 1993.

Insecticide: None

Herbicide: 2 pts/a Bronate was applied May 23, 1994.

Depth of Moisture at planting time: 24 inches

Precipitation for average crop year = 13.61 inches. Precipitation for 1994 crop year = 12.10 in. Crop year considered to be from October 1, 1993 through September 30, 1994.

Precipitation for April 1 - August 31 period during 1994 = 8.98 inches. Average precipitation for same period = 9.39 inches.

Table 2. Relative yielding abilities of spring wheat varieties as compared to Stoa when grown in the dryland Uniform Regional hard red spring wheat trial at the Eastern Agricultural Research Center, Sidney, Montana, during the 1990-1994 period.

Cultivar	# of Years	1990	1991	1992	1993	1994	Ave	as % of Stoa
McNeal	2	--	--	79.0	64.4	--	71.7	125.5
ND 673	3	--	--	71.7	50.8	58.6	60.4	117.4
Hamer	1	--	--	--	--	67.1	67.1	114.5
Lars	1	--	--	--	--	66.7	66.7	113.8
Era	5	39.3	35.8	77.4	51.9	60.5	53.0	105.3
Kulm	3	--	41.3	66.3	51.4	--	53.0	104.6
Norlander	1	--	--	--	--	59.4	59.4	101.4
Butte 86	5	38.0	40.5	65.3	47.5	62.0	50.7	100.7
Stoa	5	40.9	37.7	69.0	45.3	58.6	50.3	100.0
ND 677	2	--	--	--	46.2	53.2	49.7	95.7
AC Minto	1	--	31.5	--	--	--	31.5	83.6
Marquis	5	30.5	24.0	72.1	32.8	47.1	41.3	82.1
Chris, 525-1	4	33.8	33.0	--	34.2	47.5	37.1	81.4

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, Stoa.

Table 3. Relative test weights of spring wheat varieties as compared to Stoa when grown in the dryland Uniform Regional hard red spring wheat trial at the Eastern Agricultural Research Center, Sidney, Montana, during the 1990-1994 period.

Cultivar	# of Years	1990	1991	1992	1993	1994	Ave	as % of Stoa
Kulm	3	--	62.5	62.7	58.5	--	61.2	102.9
ND 673	3	--	--	63.7	58.8	59.7	60.7	101.8
Norlander	1	--	--	--	--	61.1	61.1	101.8
Hamer	1	--	--	--	--	61.1	61.1	101.8
McNeal	2	--	--	62.7	58.2	--	60.4	101.7
ND 677	2	--	--	--	57.2	61.3	59.2	101.5
Butte 86	5	57.0	60.5	62.8	56.5	61.4	59.6	100.9
Marquis	5	59.4	58.8	62.5	57.3	60.2	59.6	100.9
Stoa	5	57.0	59.7	62.2	56.7	60.0	59.1	100.0
Chris, 525-1	4	56.0	59.3	--	56.7	60.3	58.1	99.5
Era	5	56.0	57.7	62.5	56.7	59.6	58.5	99.0
Lars	1	--	--	--	--	59.0	59.0	98.3
AC Minto	1	--	57.9	--	--	--	57.9	97.0

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

Table 4. Relative protein contents of spring wheat varieties as compared to Stoa when grown in the dryland Uniform Regional hard red spring wheat trial at the Eastern Agricultural Research Center, Sidney, Montana, during the 1990-1994 period.

Cultivar	# of Years	1990	1991	1992	1993	1994	Ave	as % of Stoa
Kulm	3	--	17.4	16.7	14.7	--	16.3	104.3
AC Minto	1	--	17.3	--	--	--	17.3	104.2
Chris, 525-1	4	17.3	17.1	--	14.2	13.7	15.6	101.8
Stoa	5	16.7	16.6	15.4	14.8	13.1	15.3	100.0
ND 677	2	--	--	--	14.7	13.2	14.0	100.0
Hamer	1	--	--	--	--	13.1	13.1	100.0
ND 673	3	--	--	15.6	13.8	13.8	14.4	99.8
Norlander	1	--	--	--	--	13.0	13.0	99.2
Butte 86	5	16.7	16.3	16.1	13.2	12.9	15.0	98.2
Marquis	5	16.6	16.4	15.5	13.0	13.4	15.0	97.8
McNeal	2	--	--	15.0	14.0	--	14.5	96.0
Lars	1	--	--	--	--	12.3	12.3	93.9
Era	5	16.3	16.0	14.0	13.0	11.3	14.1	92.2

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

Table 5 Agronomic data obtained from a dryland uniform regional durum wheat yield trial conducted at the Eastern Agricultural Research Center, Sidney, Montana, 1994.

Date Seeded: April 15, 1994 Date Harvested: August 11, 1994 Plot Size: 40 Sq. Ft.[1/]

Variety	Average Days to Heading[2/]	Average Height Inches	Average Protein Content %	Average Test Wt. Lbs/Bu	Average Yield Bu/Acre
D901313	65	33	11.5	61.0	68.3
D901442	64	32	12.0	62.7	68.3
Renville	65	36	11.2	61.4	66.6
D88450	66	29	11.3	61.9	66.5
D87450	64	29	11.4	59.7	66.2
D601419	63	31	11.4	62.6	66.2
D901735	66	27	11.5	60.5	65.3
D89424	64	28	11.2	61.4	64.2
D87240	66	37	11.3	61.5	64.2
D88303	65	29	11.0	61.7	64.0
D89172	65	33	11.0	62.0	63.2
D901786	63	30	11.9	61.8	62.4
D88273	64	34	11.9	60.9	62.3
D87130	65	35	11.8	63.0	62.0
Lloyd	66	27	12.4	59.2	62.0
D8460	65	35	11.6	63.2	61.9
Vic	64	37	12.4	62.4	61.6
D901536	65	33	11.8	63.6	61.6
D89476	64	36	12.0	61.8	61.5
D89331	65	39	11.6	61.2	60.4
Medora	64	38	12.5	61.7	60.4
D89135	64	33	11.6	62.5	60.3
Sceptre	65	34	11.4	61.3	59.2
Plenty	66	41	11.8	61.0	59.2
Monroe	61	37	12.2	61.1	59.2

(Continued)

Table 5 (Continued) Agronomic data obtained from a dryland uniform regional durum wheat yield trial conducted at the Eastern Agricultural Research Center, Sidney, Montana, 1994.

Date Seeded: April 15, 1994 Date Harvested: August 11, 1994 Plot Size: 40 Sq. Ft.1/

Variety	Average Days to Heading 2/	Average Height Inches	Average Protein Content %	Average Test Wt. Lbs/Bu	Average Yield Bu/Acre
D89111	65	33	12.1	61.7	58.7
D901486	63	32	11.5	61.0	58.4
Kyle	67	41	12.4	60.6	58.1
Rugby	64	36	12.7	62.1	57.7
Ward	63	37	12.4	62.5	57.4
D89346	63	31	10.8	62.4	56.6
Stoa	64	37	13.1	60.1	56.6
Mindum	68	45	11.0	62.4	55.5
D901518	66	33	9.0	61.2	53.8
Mean	65	34	11.7	61.6	61.5
F-Value	8.03	25.65	4.23	3.76	1.63
SE of the mean	0.46	0.82	0.35	0.50	2.90
LSD (0.05)	1.30	2.31	0.98	1.41	NS
CV (SE/Mean)	0.71	2.40	2.97	0.81	4.72
CV (s/Mean)	1.24	4.16	5.15	1.40	8.18

NS indicates no significant difference among varieties at any level.

(Continued)

Table 5 (Continued) Agronomic data obtained from a dryland uniform regional durum wheat yield trial conducted at the Eastern Agricultural Research Center, Sidney, Montana, 1994.

1/ 4 row plots, rows 10 ft. long and 1.0 ft. apart. At harvest the two center rows were taken for yield, test weight, and protein determinations.

2/ Heading date is the number of days from planting date.

Ward is the check variety with an average yield of 57.4 Bu/Acre.

Previous crop: Summer fallow Soil type: Williams Loam

Residual soil P: 39 lbs/acre to 6 inches.

Residual soil N: 0 - 1 ft. 30 lbs/a. 2 - 3 ft. 23 lbs/a.
1 - 2 ft. 27 lbs/a. 3 - 4 ft. 20 lbs/a.

Fertilizer: 30 lbs/a of N as 28-0-0 liquid nitrogen was applied on November 10, 1993.

Insecticide: None

Herbicide: 2 pts/a Bronate was applied May 23, 1994.

Depth of Moisture at planting time: 24 inches

Precipitation for average crop year = 13.61 inches. Precipitation for 1994 crop year = 12.10 in. Crop year considered to be from October 1, 1993 through September 30, 1994.

Precipitation for April 1 - August 31 period during 1994 = 8.98 inches. Average precipitation for same period = 9.39 inches.

Table 6. Relative yielding abilities of durum varieties as compared to Ward when grown in the dryland Uniform Regional durum yield trial at the Eastern Agricultural Research Center, Sidney, Montana, during the 1990-1994 period.

Cultivar	# of Years	1990	1991	1992	1993	1994	Ave	as % of Ward
Renville	5	36.6	41.6	69.0	36.4	66.6	50.0	111.4
D8460	5	35.6	40.7	60.7	48.8	61.8	49.5	110.2
Sceptre	5	34.5	44.6	63.7	41.7	59.2	48.7	108.5
Plenty	2	--	--	--	44.5	59.2	51.8	105.2
Medora	5	36.0	39.0	65.9	31.7	60.4	46.6	103.7
Lloyd	5	36.9	37.7	64.0	30.9	62.0	46.3	103.1
Kyle	1	--	--	--	--	58.0	58.0	101.0
Ward	5	34.8	38.7	52.5	41.2	57.4	44.9	100.0
Vic	5	33.1	32.7	63.1	31.8	61.6	44.5	99.0
Rugby	5	33.0	36.9	55.8	38.4	57.7	44.4	98.8
Monroe	5	33.9	35.3	55.5	30.6	59.2	42.9	95.5
Mindum	5	31.1	35.0	55.7	30.1	55.5	41.5	92.3

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, Ward.

Table 7. Relative test weights of uniform regional durum varieties as compared to Ward when grown in the dryland Uniform Regional durum yield trial at the Eastern Agricultural Research Center, Sidney, Montana, during the 1990-1994 period.

Cultivar	# of Years	1990	1991	1992	1993	1994	Ave	as % of Ward
Mindum	5	62.4	58.9	64.5	58.2	62.4	61.3	101.3
Ward	5	60.0	59.5	62.8	57.8	62.5	60.5	100.0
Rugby	5	60.0	59.6	62.8	57.7	62.1	60.4	99.9
Medora	5	60.5	59.9	63.2	56.9	61.7	60.4	99.9
Vic	5	60.0	59.6	62.8	57.1	62.4	60.4	99.8
Renville	5	59.5	60.4	62.8	57.5	61.4	60.3	99.7
D8460	5	59.0	59.3	62.2	57.2	63.2	60.2	99.4
Sceptre	5	59.0	59.6	62.5	56.2	61.3	59.7	98.7
Plenty	2	--	--	--	57.2	61.0	59.1	98.3
Monroe	5	59.0	58.1	62.5	56.4	61.1	59.4	98.2
Kyle	1	--	--	--	--	60.6	60.6	97.0
Lloyd	5	60.0	57.5	62.0	53.7	59.2	58.5	96.6

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, Ward.

Table 8. Relative protein contents of uniform regional durum varieties as compared to Ward when grown in the dryland Uniform Regional durum yield trial at the Eastern Agricultural Research Center, Sidney, Montana, during the 1990-1994 period.

Cultivar	# of Years	1990	1991	1992	1993	1994	Ave	as % of Ward
Ward	5	18.1	17.2	16.8	14.5	12.4	15.8	100.0
Medora	5	19.0	17.9	15.8	13.8	12.5	15.8	100.0
Kyle	1	--	--	--	--	12.4	12.4	100.0
D8460	5	18.5	17.9	15.2	14.3	11.6	15.5	98.1
Rugby	5	17.8	17.5	16.1	13.3	12.7	15.5	98.0
Monroe	5	17.2	17.5	16.8	13.4	12.2	15.4	97.6
Vic	5	17.4	17.2	15.9	13.7	12.4	15.3	97.0
Renville	5	17.7	17.9	16.0	13.1	11.2	15.2	96.1
Plenty	2	--	--	--	13.8	11.8	12.8	95.2
Mindum	5	17.8	17.6	14.9	13.7	11.0	15.0	94.9
Lloyd	5	16.4	17.8	14.2	13.9	12.4	14.9	94.6
Sceptre	5	18.3	16.2	14.9	13.4	11.4	14.8	93.9

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

Table 9 Agronomic data obtained from a dryland northern regional winter wheat yield trial conducted at the Eastern Agricultural Research Center, Sidney, Montana, 1994.

Date Seeded: September 16, 1993 Date Harvested: August 3, 1994 Plot Size: 40 Sq. Ft.[1/]

Variety	Average Days to Heading[2/]	Average Height Inches	Percent Winter Survival	Average Protein Content %	Average Test Wt. Lbs/Bu	Average Yield Bu/Acre
XNH-1	157	28	85	10.8	63.3	64.0 a
XNH 1727	156	30	86	11.9	63.3	62.6 a
ID 0355HW	160	35	79	11.1	62.8	60.7
NE 90625	155	30	88	10.8	62.0	60.6
XNH-2	157	28	76	11.3	63.7	60.4
ND 8889	158	35	91	11.1	63.2	60.3
ND 9064	158	37	90	11.8	62.8	60.3
ND 8955	158	32	86	10.8	62.3	60.1
SD 89153	157	30	85	12.7	63.3	59.4
ND 8974	158	31	93	10.8	63.3	59.3
XNH 1772	155	31	90	11.9	62.4	58.8
NE 91631	158	32	85	10.0	61.5	58.7
SD 89180	155	31	86	12.9	63.4	58.2
XNH 1564	155	27	81	12.0	62.9	57.0
NE 91562	156	31	93	12.6	62.6	56.4
SD 89186	155	29	90	11.8	62.6	55.3
NE 91648	156	30	89	12.0	63.0	54.4
Roughrider	159	36	86	11.5	63.1	54.3
NE 90616	155	27	94	12.6	60.8	54.0

(Continued)

Table 9 (Continued) Agronomic data obtained from a dryland northern regional winter wheat yield trial conducted at the Eastern Agricultural Research Center, Sidney, Montana, 1994.

Date Seeded: September 16, 1993 Date Harvested: August 3, 1994 Plot Size: 40 Sq. Ft.[1/]

Variety	Average Days to Heading[2/]	Average Height Inches	Percent Winter Survival	Average Protein Content %	Average Test Wt. Lbs/Bu	Average Yield Bu/Acre
ND 90109	158	34	90	11.1	62.0	53.1
SD 89205	154	28	88	12.4	62.9	52.8
ID 0426	160	29	74	10.3	61.0	52.8
ND 8933	160	36	85	10.7	62.0	52.7
SD 89119	155	29	81	12.9	61.7	51.8
ND 9043	159	36	93	12.1	62.0	51.5
Abilene	155	24	86	13.1	63.4	50.1
SD 89333	153	28	83	12.9	62.9	50.0
HBC197F	154	28	74	12.9	62.6	48.8
Kharkof	159	36	89	12.4	63.0	46.6
Mean	157	31	86	11.8	62.6	56.0
F-Value	12.65	16.95	1.29	13.27	2.72	2.67
SE of the mean	0.55	0.82	4.73	0.24	0.45	2.74
LSD (0.05)	1.54	2.31	--	0.68	1.26	7.71
LSD (0.01)	--	--	--	--	--	10.32
CV (SE/Mean)	0.35	2.64	5.50	2.05	0.72	4.90
CV (s/Mean)	0.70	5.28	11.01	4.10	1.43	9.79

(Continued)

Table 9 (Continued) Agronomic data obtained from a dryland northern regional winter wheat yield trial conducted at the Eastern Agricultural Research Center, Sidney, Montana, 1994.

1/ 4 row plots, rows 10 ft. long and 1.0 ft. apart. At harvest the two center rows were taken for yield, test weight, and protein determinations.

2/ Heading date is the number of days from January 1st.

Roughrider is the check variety with an average yield of 54.3 Bu/Acre.

a Indicates a significantly greater yield than check Roughrider at the 0.05 level of significance.

Previous crop: Summer fallow Soil type: Williams Loam

Residual soil P: 35 lbs/acre to 6 inches.

Residual soil N: 0 - 1 ft. 30 lbs/a. 2 - 3 ft. 23 lbs/a.
1 - 2 ft. 27 lbs/a. 3 - 4 ft. 20 lbs/a.

Fertilizer: 30 lbs/a of N as 28-0-0 liquid nitrogen was applied November 10, 1993.

Herbicide: None

Precipitation for average crop year = 13.61 inches. Precipitation for 1994 crop year = 12.10 in. Crop year considered to be from October 1, 1993 through September 30, 1994.

Precipitation for April 1 - August 31 period during 1993 = 8.98 inches. Average precipitation for same period = 9.39 inches.

Table 10. Relative yielding abilities of winter wheat varieties as compared to Roughrider when grown in the dryland Northern Regional Winter Wheat trial at the Eastern Agricultural Research Center, Sidney, Montana, during the 1990-1994 period.

Cultivar	# of Years	1990	1991	1992	1993	1994	Ave	as % of Roughrider
ND 8889	2	--	--	--	45.1	60.3	52.7	114.9
MT 8713	2	--	--	89.3	43.3	--	66.3	106.2
MT 8719	2	--	--	83.0	44.1	--	63.6	101.8
Roughrider	5	39.0	43.0	87.5	37.4	54.3	52.2	100.0
ND 8933	3	--	--	89.8	35.6	52.7	59.4	99.4
Abilene	2	--	--	--	40.7	50.1	45.4	99.0
Colt	2	43.6	--	75.0	--	--	59.3	93.8
Kharkof	4	40.0	28.9	--	31.8	46.6	36.8	84.8
Tomahawk	1	--	--	--	29.0	--	29.0	77.5

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, Roughrider.

Table 11. Relative test weights of winter wheat varieties as compared to Roughrider when grown in the dryland Northern Regional Winter Wheat trial at the Eastern Agricultural Research Center, Sidney, Montana, during the 1990-1994 period.

Cultivar	# of Years	1990	1991	1992	1993	1994	Ave	as % of Roughrider
Kharkof	4	58.0	61.5	--	61.6	63.0	61.0	101.7
Abilene	2	--	--	--	63.1	63.4	63.2	101.1
MT 8713	2	--	--	64.0	61.8	--	62.9	100.5
Colt	2	58.0	--	63.4	--	--	60.7	100.2
Roughrider	5	58.0	60.2	63.2	62.0	63.1	60.6	100.0
MT 8719	2	--	--	63.5	60.5	--	62.0	99.0
ND 8889	2	--	--	--	60.7	63.2	62.0	99.0
ND 8933	3	--	--	62.1	60.3	62.0	61.5	97.9
Tomahawk	1	--	--	--	60.3	--	60.3	97.3

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, Roughrider.

Table 12. Relative protein contents of winter wheat varieties as compared to Roughrider when grown in the dryland Northern Regional Winter Wheat trial at the Eastern Agricultural Research Center, Sidney, Montana, during the 1990-1994 period.

Cultivar	# of Years	1990	1991	1992	1993	1994	Ave	as % of Roughrider
Tomahawk	1	--	--	--	11.8	--	11.8	120.4
Abilene	2	--	--	--	11.4	13.1	12.2	115.0
MT 8719	2	--	--	12.4	10.5	--	11.5	104.1
Kharkof	4	15.1	13.9	--	10.1	12.4	12.9	101.4
Roughrider	5	15.4	14.1	12.2	9.8	11.5	12.6	100.0
MT 8713	2	--	--	12.1	9.2	--	10.6	96.8
Colt	2	14.4	--	11.9	--	--	13.2	95.3
ND 8889	2	--	--	--	9.0	11.1	10.0	94.4
ND 8933	3	--	--	11.2	9.6	10.7	10.5	94.0

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, Roughrider.

Table 13 Agronomic data obtained from a dryland uniform regional spring oat yield trial conducted at the Eastern Agricultural Research Center, Sidney, Montana, 1994.

Date Seeded: April 5, 1994 Date Harvested: August 1, 1994 Plot Size: 40 Sq. Ft.[1/]

Variety	Average Days to Heading[2/]	Average Height Inches	Average Protein Content %	Average Test Wt. Lbs/Bu	Average Yield Bu/Acre
87AB5125	73	32	10.2	39.8	147.6 a
Border	75	34	11.1	39.0	145.0 a
82AB248	75	31	9.4	37.5	137.4
Monida	75	36	9.5	42.3	131.1
Rio Grande	70	34	11.2	41.8	129.6
ND 852107	72	39	10.7	41.0	127.8
83AB3119	74	30	10.2	38.2	126.9
Ajay	73	27	11.4	38.7	126.9
83AB3250	76	32	9.4	39.5	126.2
Whitestone	74	34	10.5	43.0	125.4
Appaloosa	74	33	10.2	39.0	122.4
Whitestone (ND870258)	74	35	11.2	42.5	120.9
ND 860416	75	38	10.4	41.8	120.1
Valley	72	36	11.4	44.0	118.5
82AB1178	71	29	9.9	39.8	117.9
Newdak	68	36	11.3	41.3	116.3
Otana	73	39	10.9	43.3	115.4
89AB1545	68	33	10.7	41.5	113.0
Ogle	68	35	11.1	42.3	112.6
IAH613-3	71	39	11.6	42.3	111.2
89AB6153	68	33	10.8	44.6	109.8
Cayuse	73	35	10.4	40.5	109.2
86AB664	73	36	10.2	41.3	108.1

(Continued)

Table 13 (Continued) Agronomic data obtained from a dryland uniform regional spring oat yield trial conducted at the Eastern Agricultural Research Center, Sidney, Montana, 1994.

Date Seeded: April 5, 1994 Date Harvested: August 1, 1994 Plot Size: 40 Sq. Ft.[1/]

Variety	Average Days to Heading[2/]	Average Height Inches	Average Protein Content %	Average Test Wt. Lbs/Bu	Average Yield Bu/Acre
87Ab4983	69	30	10.9	44.2	107.3
Robert	75	36	10.7	39.8	105.6
86AB1867	68	30	11.1	45.0	105.1
84Ab825	73	32	10.4	41.0	103.2
88Ab3073	74	34	12.3	48.9	103.1
Park	73	40	11.4	42.3	102.0
Rodney	72	40	10.9	40.7	100.6
90AB1322	73	30	11.0	42.3	100.0
86AB1616	76	35	11.6	45.1	100.0
Troy	70	41	12.2	44.8	99.1
Calibre	75	40	10.4	42.8	92.3
Derby	74	43	10.9	43.0	89.7
Paul	75	40	12.5	47.9	89.1
Riel	72	38	12.2	44.5	86.1 x
Settler	69	37	12.1	46.5	82.2 x
Paul (HD862915)	77	39	15.8	48.6	75.6 xx
Mean	73	35	11.0	42.4	111.8
F-Value	29.82	26.71	4.98	5.40	3.06
SE of the mean	0.45	0.74	0.49	1.18	9.46
LSD (0.05)	1.28	2.09	1.39	3.32	26.64
LSD (0.01)	--	--	--	--	35.58
CV (SE/Mean)	0.63	2.12	4.46	2.78	8.46
CV (s/Mean)	1.09	3.67	7.73	4.82	14.65

(Continued)

Table 13 (Continued) Agronomic data obtained from a dryland uniform regional spring oat yield trial conducted at the Eastern Agricultural Research Center, Sidney, Montana, 1994.

1/ 4 row plots, rows 10 ft. long and 1.0 ft. apart. At harvest the two center rows were taken for yield, test weight, and protein determinations.

2/ Heading date is the number of days from planting date.

Otana is the check variety with an average yield of 115.4 Bu/Acre.

a Indicates a significantly greater yield than check Otana at the 0.05 level of significance.
x Indicates a significantly lower yield than check Otana at the 0.05 level of significance.
xx Indicates a significantly lower yield than check Otana at the 0.01 level of significance.

Previous crop: Summer fallow Soil type: Williams Loam

Residual soil P: 39 lbs/acre to 6 inches.

Residual soil N: 0 - 1 ft. 30 lbs/a. 2 - 3 ft. 23 lbs/a.
1 - 2 ft. 27 lbs/a. 3 - 4 ft. 20 lbs/a.

Fertilizer: 30 lbs/a of N as 28-0-0 liquid nitrogen was applied on November 10, 1993.

Insecticide: None

Herbicide: 2 pts/a Bronate was applied May 23, 1994.

Depth of Moisture at planting time: 22 inches

Precipitation for average crop year = 13.61 inches. Precipitation for 1994 crop year = 12.10 in. Crop year considered to be from October 1, 1993 through September 30, 1994.

Precipitation for April 1 - August 31 period during 1994 = 8.98 inches. Average precipitation for same period = 9.39 inches.

Table 14. Relative yielding abilities of oat varieties in the Uniform Regional Oat yield trial as compared to Otana when grown under dryland conditions at the Eastern Agricultural Research Center, Sidney, Montana, during the 1990-1994 period.

Cultivar	# of Years	1990	1991	1992	1993	1994	Ave	as % of Otana
Border	5	79.6	98.7	182.2	99.5	145.0	121.0	109.6
Whitestone	1	--	--	--	--	125.4	125.4	108.7
Monida	5	77.5	90.2	187.0	100.8	131.1	117.3	106.3
Ajay	5	77.7	97.4	170.4	101.7	126.9	114.8	104.0
Rio Grande	5	80.4	89.7	169.9	102.0	129.6	114.3	103.6
Newdak	4	--	94.7	186.2	86.6	116.3	121.0	101.6
Otana	5	75.5	83.4	188.7	88.9	115.4	110.4	100.0
Appaloosa	5	73.3	88.1	177.9	89.0	122.4	110.1	99.8
Cayuse	5	81.7	91.6	166.3	91.1	109.2	108.0	97.8
Ogle	5	77.0	93.7	162.3	89.6	112.6	107.0	97.0
Valley	5	71.6	84.7	164.3	91.0	118.5	106.0	96.0
Derby	3	--	--	195.6	90.9	89.6	125.4	95.7
Calibre	5	64.9	74.0	199.5	97.0	92.2	105.5	95.6
Park	5	69.6	85.1	175.7	76.5	102.0	101.8	92.2
Rodney	2	73.8	--	--	--	100.6	87.2	91.4
Robert	5	62.1	81.4	176.1	69.3	105.6	98.9	89.6
Riel	5	72.3	78.9	169.6	79.9	86.0	97.3	88.2
Troy	1	--	--	--	--	99.1	99.1	85.9
Paul	1	--	--	--	--	89.1	89.1	77.2
Settler	1	--	--	--	--	82.2	82.2	71.2

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, Otana.

Table 15 . Relative test weights of oat varieties in the Uniform Regional Oat yield trial as compared to Otana when grown under dryland conditions at the Eastern Agricultural Research Center, Sidney, Montana, during the 1990-1994 period.

Cultivar	# of Years	1990	1991	1992	1993	1994	Ave	as % of Otana
Paul	1	--	--	--	--	47.9	47.9	110.6
Settler	1	--	--	--	--	46.5	46.5	107.4
Troy	1	--	--	--	--	44.8	44.8	103.5
Riel	5	39.5	38.7	37.7	37.0	44.5	39.5	101.9
Valley	5	37.3	37.0	38.2	37.6	44.0	38.8	100.2
Otana	5	38.1	35.8	38.3	38.3	43.3	38.8	100.0
Derby	3	--	--	39.7	37.2	43.0	40.0	100.0
Whitestone	1	--	--	--	--	43.0	43.0	99.3
Calibre	5	39.3	34.3	38.7	35.7	42.8	38.2	98.5
Rodney	2	38.2	--	--	--	40.7	39.4	96.9
Ogle	5	34.2	37.2	36.3	37.2	42.3	37.4	96.6
Newdak	4	--	37.2	35.7	35.8	41.3	37.5	96.3
Monida	5	35.8	32.5	38.3	37.0	42.3	37.2	95.9
Robert	5	36.4	36.8	36.7	36.1	39.8	37.2	95.9
Rio Grande	5	34.5	36.0	37.3	36.0	41.8	37.1	95.8
Park	5	36.9	34.5	36.0	34.7	42.3	36.9	95.1
Ajay	5	34.1	36.6	37.3	36.8	38.7	36.7	94.7
Border	5	31.7	32.7	36.5	35.5	39.0	35.1	90.5
Cayuse	5	31.9	31.6	36.2	33.5	40.5	34.7	89.6
Appaloosa	5	31.8	29.9	36.0	34.5	39.0	34.2	88.3

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, Otana.

Table 16. Relative protein contents of oat varieties in the Uniform Regional Oat yield trial as compared to Otana when grown under dryland conditions at the Eastern Agricultural Research Center, Sidney, Montana, during the 1990-1994 period.

Cultivar	# of Years	1990	1991	1992	1993	1994	Ave	as % of Otana
Paul	1	--	--	--	--	12.5	12.5	114.7
Troy	1	--	--	--	--	12.2	12.2	111.9
Settler	1	--	--	--	--	12.1	12.1	111.0
Ajay	5	15.0	14.4	11.9	12.3	11.4	13.0	103.3
Riel	5	14.6	14.0	11.9	11.7	12.2	12.9	102.4
Park	5	14.7	14.0	12.3	11.9	11.4	12.9	102.2
Valley	5	15.1	14.1	12.1	11.6	11.4	12.9	102.2
Rodney	1	14.7	--	--	--	10.9	12.8	102.0
Otana	5	14.2	13.8	12.1	11.9	10.9	12.6	100.0
Border	5	14.8	13.4	11.9	11.4	11.1	12.5	99.5
Robert	5	14.0	14.3	11.9	11.0	10.7	12.4	98.4
Newdak	4	--	13.3	11.7	11.4	11.3	11.9	97.9
Derby	3	--	--	11.9	11.1	10.9	11.3	97.1
Calibre	5	14.4	13.6	11.1	11.5	10.4	12.2	97.0
Ogle	5	13.8	13.4	11.9	10.6	11.1	12.2	96.7
Rio Grande	5	13.9	14.1	11.1	10.4	11.2	12.1	96.5
Cayuse	5	14.0	14.0	10.9	11.4	10.4	12.1	96.5
Whitestone	1	--	--	--	--	10.5	10.5	96.3
Appaloosa	5	14.2	13.6	11.4	10.6	10.2	12.0	95.4
Monida	5	13.4	12.8	10.2	10.8	9.5	11.3	90.1

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