

PROJECT TITLE: Evaluation of spring wheat, durum, barley, and oat varieties under minimum-till, continuous cropping conditions – 2001

PROJECT LEADER:

Joyce Eckhoff, Eastern Agricultural Research Center, 1501 N Central Ave, Sidney, MT 59270
phone: (406)433-2208 fax: (406)433-7336 e-mail: jeckhoff@sidney.ars.usda.gov

OBJECTIVE: To determine the best adapted varieties of spring wheat, durum, barley, and oats for production under continuous cropping conditions in eastern Montana.

MATERIALS AND METHODS: All trials were replicated three times. Plots were 20 feet long and four rows wide, with one foot between rows. At harvest, all rows were harvested with a plot combine and tested for yield, test weight, and protein contents.

Planting dates in 2001 were

Crop	Planting date	Harvest date	Plot size
Spring wheat	30 April	14 August	80 ft ² , entire plot harvested.
Durum	30 April	14 August	80 ft ² , entire plot harvested.
Barley	30 April	9 August	80 ft ² , entire plot harvested.
Oat	30 April	9 August	80 ft ² , entire plot harvested.

SOIL TYPE: Williams clay loam

PREVIOUS CROPS: 2000 - spring wheat, 1999 - safflower, 1998 - small grain plots

RESIDUAL SOIL N TO 3 FT: 144 lb/acre

RESIDUAL SOIL P TO 6 IN: 62 ppm

RESIDUAL SOIL K TO 6 IN: 612 ppm

APPLIED FERTILIZER: 30 lb/ac as liquid 28-0-0 applied

HERBICIDES: 1.5 pt/ac Bronate applied 6 June 2001

PRECIPITATION APR-AUG, 2001: 16.43 inches

AVE (53 yr) PRECIPITATION APR-AUG: 9.53 inches

PRECIPITATION SEP 2000 – AUG 2001: 22.79 inches

AVE (53 yr) PRECIPITATION SEP-AUG: 13.91 inches

COMMENTS:

Soil moisture was adequate at planting, but because of good yields in 1999, residue was heavy, causing some problems with seed-soil contact, so emergence was not perfect. There was little sub-soil moisture, and the recrop trials showed moisture stress early in the growing season.

RESULTS:

Spring wheat: Twenty-two lines and varieties of spring wheat were tested under dryland recrop conditions (Table 1). Nine lines and varieties yielded significantly more than the check variety, McNeal, and two yielded significantly less. Average yield was 47.8 bu/acre. Five-year summaries for yield, test weight, height, and protein content are shown in Tables 2 through 5.

Durum: Seventeen durum varieties were tested under dryland recrop conditions (Table 6). Plaza yielded significantly more than the check variety, Renville and five lines and varieties yielded significantly less. Average yield was 47.9 bu/acre. Five-year summaries for yield, test weight, height, and protein content are shown in Tables 7 through 10.

Barley: Sixteen barley lines and varieties were tested under dryland recrop conditions (Table 11). Baronesse yielded most and three entries yielded significantly less than the check variety, Gallatin. Average yield was 64.4 bu/acre. Five-year summaries for yield, test weight, height, and protein content are shown in Tables 12 through 15.

Oats: Fourteen oat varieties were tested under dryland recrop conditions (Table 16). Celsia and Monida yielded most. Average yield was 92.8 bu/acre. Five-year summaries for yield, test weight, height, and protein content are shown in Tables 17 through 20.

SUMMARY: The experiments reported under this project are all of the replicated small plot type. The three-year crop rotation is small grain, small grain yield trials, safflower. Bromoxynil at a rate of 1.5 pt/acre is used for broadleaf weed control in the small grain, and trifluralin at a rate of 1.5 pt/acre is used in the safflower. This weed control and crop rotation have been effective in controlling weeds in the yield trial plots, but volunteer small grain has been a problem in some years, although not a severe problem in 2001.

FUTURE PLANS: New varieties will continue to be tested under continuous cropping conditions to identify those which will perform best under these conditions. Closer cooperation with the Williston Research Center will allow testing of experimental lines from North Dakota as well as from Montana, so that when those lines are released as varieties, information will be available as to their performance under continuous cropping conditions.

Table 1. Agronomic data obtained from a dryland recrop spring wheat yield trial conducted at the Eastern Agricultural Research Center, Sidney, MT.

Planting date: 30 April 2001 Harvest date: 14 August 2001

Variety	Days to heading ¹	Height, inches	Protein content	Test wt, lb/bu	Yield bu/acre	
McVey	60	30	10.4	60.7	58.6	a
Reeder	56	28	14.2	61.3	55.6	a
MT9874	58	31	12.3	60.0	53.8	a
Alsen	56	29	14.0	62.7	52.4	a
Verde	58	27	11.1	60.7	52.3	a
Scholar	58	32	12.9	61.8	52.2	a
Parshall	55	32	14.1	63.3	50.6	a
Gunner	60	32	12.7	62.5	50.2	a
ND722	58	33	13.1	62.5	49.3	a
Express	57	25	12.4	60.2	48.2	
MT9929	55	27	12.4	60.7	47.3	
Amidon	56	33	12.5	61.0	47.1	
MTHW9904*	55	32	12.8	62.2	47.0	
Argent*	56	31	13.5	61.8	46.3	
MTHW9420*	55	27	11.4	59.0	46.3	
McNeal	58	28	10.9	59.7	45.0	
NK Bounty	56	28	11.8	59.7	43.8	
Ernest	56	33	13.1	60.8	43.4	
Conan	55	27	12.2	61.2	43.2	
CDC Bounty	56	34	14.6	62.0	41.8	
Explorer*	54	27	12.9	58.2	39.2	x
Pristine*	53	27	12.0	60.7	38.5	x
mean	56	30	12.6	61.0	47.8	
probability	<0.001	<0.001	<0.001	<0.001	<0.001	
CV (S/mean)	1.0	3.8	3.8	0.7	5.0	
LSD _{0.05}	1.0	1.9	0.8	0.7	3.9	

Check variety is McNeal with an average yield of 45.0 bu/acre.
a indicates significantly greater yield than check variety, McNeal
x indicates significantly lower yield than check variety, McNeal
* hard white wheat

¹ Heading date is number of days from planting

Table 2. Relative yields of spring wheat varieties as compared to McNeal when grown under dryland continuous cropping at the EARC, Sidney, Montana.

Cultivar	1997	1998	1999	2000	2001	Ave	as % of McNeal
McVey	--	--	62.3	16.2	58.6	45.7	127.2
MT9874	--	--	--	--	53.8	53.8	119.6
Reeder	--	42.6	53.3	17.0	55.6	42.1	115.3
Alsen	--	--	--	15.4	52.4	33.9	111.9
Gunner	--	--	--	--	50.2	50.2	111.6
Verde	--	--	--	14.6	52.3	33.5	110.4
ND722	--	--	--	--	49.3	49.3	109.6
Scholar	32.2	37.7	49.8	15.8	52.2	37.5	109.4
Parshall	--	35.4	54.6	16.0	50.6	39.2	107.1
Amidon	30.8	37.3	50.1	15.8	47.1	36.2	105.6
MT9929	--	--	--	--	47.3	47.3	105.1
MTHW9904	--	--	--	--	47.0	47.0	104.4
Argent	--	33.6	54.9	13.8	46.3	37.2	101.6
Conan	--	--	48.2	16.5	43.2	36.0	100.1
McNeal	25.3	38.4	47.2	15.6	45.0	34.3	100.0
NK Bounty	--	--	--	15.2	43.8	29.5	97.4
Ernest	24.0	32.8	50.5	15.8	43.4	33.3	97.1
MTHW9420	13.4	36.0	50.2	15.2	46.3	32.2	93.9
CDC Bounty	--	--	--	--	41.8	41.8	92.9
Explorer	--	--	--	13.7	39.2	26.5	87.3
Westbred Express	12.6	--	--	--	48.2	30.4	86.5
Pristine	--	--	--	--	38.5	38.5	85.6

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 spring wheat varieties as compared to McNeal when grown under dryland continuous cropping at the EARC, Sidney, Montana.

Cultivar	1997	1998	1999	2000	2001	Ave	as % of McNeal
Gunner	--	--	--	--	62.5	62.5	104.7
ND722	--	--	--	--	62.5	62.5	104.7
Parshall	--	58.7	63.0	63.0	63.3	62.0	104.3
Alsen	--	--	--	63.2	62.7	63.0	104.2
MTHW9904	--	--	--	--	62.2	62.2	104.2
CDC Bounty	--	--	--	--	62.0	62.0	103.9
Scholar	59.7	59.3	61.7	62.6	61.8	61.0	103.4
Conan	--	--	61.5	62.9	61.2	61.9	102.8
Argent	--	57.3	62.0	62.5	61.8	60.9	102.5
Ernest	58.3	58.2	62.2	62.7	60.8	60.4	102.4
Westbred Express	59.3	--	--	--	60.2	59.8	102.0
Reeder	--	57.0	61.2	63.0	61.3	60.6	102.0
MT9929	--	--	--	--	60.7	60.7	101.7
Pristine	--	--	--	--	60.7	60.7	101.7
Amidon	58.8	57.2	60.5	61.8	61.0	59.9	101.4
Verde	--	--	--	61.8	60.7	61.3	101.4
NK Bounty	--	--	--	62.2	59.7	61.0	100.9
MT9874	--	--	--	--	60.0	60.0	100.5
McVey	--	--	60.2	60.4	60.7	60.4	100.4
MTHW9420	59.2	55.0	61.2	61.3	59.0	59.1	100.2
McNeal	57.4	57.2	59.7	61.1	59.7	59.0	100.0
Explorer	--	--	--	60.7	58.2	59.5	98.4

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 heights of spring wheat varieties as compared to McNeal when grown under dryland continuous cropping at the EARC, Sidney, Montana.

Cultivar	1997	1998	1999	2000	2001	Ave	as % of McNeal
CDC Bounty	--	--	--	--	34.0	34.0	121.4
ND722	--	--	--	--	33.0	33.0	117.9
Gunner	--	--	--	--	32.0	32.0	114.3
MTHW9904	--	--	--	--	32.0	32.0	114.3
Ernest	21.0	33.0	34.0	21.0	33.0	28.4	110.9
MT9874	--	--	--	--	31.0	31.0	110.7
Amidon	21.0	33.0	36.0	18.0	33.0	28.2	110.2
Scholar	21.0	31.0	35.0	18.0	32.0	27.4	107.0
Parshall	--	32.0	34.0	18.0	32.0	29.0	105.5
Argent	--	31.0	31.0	20.0	31.0	28.3	102.7
McNeal	18.0	32.0	30.0	20.0	28.0	25.6	100.0
McVey	--	--	30.0	18.0	30.0	26.0	100.0
Alsen	--	--	--	18.0	29.0	23.5	97.9
Conan	--	--	30.0	19.0	27.0	25.3	97.4
Reeder	--	30.0	29.0	20.0	28.0	26.8	97.3
MT9929	--	--	--	--	27.0	27.0	96.4
Pristine	--	--	--	--	27.0	27.0	96.4
Explorer	--	--	--	19.0	27.0	23.0	95.8
Verde	--	--	--	18.0	27.0	22.5	93.8
NK Bounty	--	--	--	17.0	28.0	22.5	93.8
MTHW9420	16.0	27.0	28.0	18.0	27.0	23.2	90.6
Westbred Express	13.0	--	--	--	25.0	19.0	82.6

NOTE: Average heights 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. Relative protein contents of spring wheat varieties as compared to McNeal when grown under dryland continuous cropping at the EARC, Sidney, Montana.

Cultivar	1997	1998	1999	2000	2001	Ave	as % of McNeal
CDC Bounty	--	--	--	--	14.6	14.6	133.9
ND722	--	--	--	--	13.1	13.1	120.2
MTHW9904	--	--	--	--	12.8	12.8	117.4
Gunner	--	--	--	--	12.7	12.7	116.5
Parshall	--	15.8	15.1	14.2	14.1	14.8	115.6
Reeder	--	15.2	14.8	14.8	14.2	14.8	115.2
Argent	--	15.7	14.5	14.7	13.5	14.6	114.1
MT9929	--	--	--	--	12.4	12.4	113.8
Alsen	--	--	--	14.7	14.0	14.4	113.0
MT9874	--	--	--	--	12.3	12.3	112.8
Pristine	--	--	--	--	12.0	12.0	110.1
Ernest	15.8	15.4	14.4	14.6	13.1	14.7	108.3
Westbred Express	16.8	--	--	--	12.4	14.6	106.6
Explorer	--	--	--	14.0	12.9	13.5	105.9
Scholar	15.7	14.9	13.0	14.0	12.9	14.1	104.1
Amidon	14.9	14.2	13.0	14.6	12.5	13.8	102.2
Conan	--	--	11.6	14.1	12.2	12.6	102.2
NK Bounty	--	--	--	13.8	11.8	12.8	100.8
McNeal	16.5	14.1	11.7	14.5	10.9	13.5	100.0
Verde	--	--	--	14.0	11.1	12.6	98.8
MTHW9420	16.3	14.9	10.8	12.7	11.4	13.2	97.6
McVey	--	--	11.7	12.3	10.4	11.5	92.7

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

Table 6. Agronomic data obtained from a dryland recrop durum yield trial conducted at the Eastern Agricultural Research Center, Sidney, MT.

Planting date: 30 April 2001 Harvest date: 14 August 2001

Variety	Days to heading ¹	Height, inches	Protein content	Test wt, lb/bu	Yield bu/acre
Plaza	58	25	13.2	60.7	55.2 a
Mountrail	58	33	12.9	62.2	53.6
Maier	57	31	14.2	61.5	52.6
Lebsock	56	30	12.9	62.0	51.3
AC Napoleon	56	30	13.9	59.8	51.1
Kyle	60	38	13.6	62.8	50.4
AC Morse	56	29	14.6	60.0	49.8
Ben	57	33	13.6	63.0	49.8
Belzer	58	33	14.1	59.8	49.6
Pierce	57	31	13.4	62.5	49.2
Renville	56	33	13.7	61.7	49.1
AC Melita	56	33	14.1	61.0	47.4
Sceptre	56	31	13.7	59.3	43.2 x
AC Avonlea	57	31	14.6	60.5	43.0 x
AC Navigator	61	27	14.1	59.8	42.9 x
AC Pathfinder	57	31	13.5	60.7	40.7 x
YU89475	55	25	13.9	55.2	34.9 x
mean	57	31	13.8	60.7	47.9
probability	<0.001	<0.001	<0.001	<0.001	<0.001
CV (S/mean)	1.5	4.3	3.7	1.4	6.0
LSD _{0.05}	1.4	2.2	0.8	1.4	4.7

Check variety is Renville with an average yield of 49.1 bu/acre.

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

¹ Heading date is number of days from planting

Table 7. Relative yields of durum varieties compared to Renville when grown under dryland continuous cropping at the EARC, Sidney, Montana.

Cultivar	1997	1998	1999	2000	2001	Ave	as % of Renville
Mountrail	--	33.7	61.2	15.6	53.6	41.0	105.5
AC Napoleon	--	--	--	--	51.1	51.1	104.1
AC Morse	--	35.8	58.7	16.9	49.8	40.3	103.7
Kyle	31.7	33.0	54.7	12.4	50.4	36.4	103.1
Plaza	--	36.1	55.4	13.5	55.2	40.1	103.0
Maier	--	34.2	57.2	14.4	52.6	39.6	101.9
Pierce	--	--	--	--	49.2	49.2	100.2
Renville	21.3	34.7	58.1	13.6	49.1	35.4	100.0
Ben	23.0	33.4	54.6	13.4	49.8	34.8	98.5
AC Melita	--	34.2	53.7	15.3	47.4	37.7	96.8
Lebsock	--	--	51.4	13.8	51.3	38.8	96.4
AC Avonlea	--	--	--	17.3	43.0	30.2	96.2
Sceptre	--	--	55.2	13.1	43.2	37.2	92.3
Belzer	--	29.2	49.7	13.4	49.6	35.5	91.3
AC Navigator	--	--	--	--	42.9	42.9	87.4
AC Pathfinder	--	--	--	--	40.7	40.7	82.9
YU89475	--	--	--	--	34.9	34.9	71.1

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 8. Relative test weights of durum varieties as compared to Renville when grown under dryland continuous cropping at the EARC, Sidney, Montana.

Cultivar	1997	1998	1999	2000	2001	Ave	as % of Renville
Pierce	--	--	--	--	62.5	62.5	101.3
Lebsock	--	--	59.5	63.0	62.0	61.5	101.0
Ben	59.9	59.2	58.2	62.8	63.0	60.6	100.2
Maier	--	59.2	59.3	63.3	61.5	60.8	100.1
Renville	59.6	60.3	58.4	62.6	61.7	60.5	100.0
AC Avonlea	--	--	--	63.3	60.5	61.9	99.6
Kyle	58.7	59.0	57.9	62.4	62.8	60.2	99.4
AC Melita	--	58.2	58.2	62.9	61.0	60.1	98.9
Mountrail	--	58.0	57.7	62.3	62.2	60.1	98.8
Plaza	--	57.7	58.3	63.3	60.7	60.0	98.8
AC Pathfinder	--	--	--	--	60.7	60.7	98.4
AC Morse	--	58.8	57.8	62.0	60.0	59.7	98.2
Sceptre	--	--	57.0	62.0	59.3	59.4	97.6
AC Napoleon	--	--	--	--	59.8	59.8	96.9
AC Navigator	--	--	--	--	59.8	59.8	96.9
Belzer	--	56.8	56.1	61.8	59.8	58.6	96.5
YU89475	--	--	--	--	55.2	55.2	89.5

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.

Table 9. Relative heights of durum varieties as compared to Renville when grown under dryland continuous cropping at the EARC, Sidney, Montana.

Cultivar	1997	1998	1999	2000	2001	Ave	as % of Renville
Kyle	21	35	38	19	38	30	109
Renville	17	33	36	20	33	28	100
Belzer	--	31	36	21	33	30	99
Ben	17	30	35	21	33	27	98
AC Avonlea	--	--	--	20	31	26	96
Mountrail	--	30	36	18	33	29	96
AC Melita	--	31	33	19	33	29	95
Pierce	--	--	--	--	31	31	94
AC Pathfinder	--	--	--	--	31	31	94
Sceptre	--	--	32	20	31	28	93
AC Napoleon	--	--	--	--	30	30	91
Lebsock	--	--	32	18	30	27	90
Maier	--	29	31	18	31	27	89
AC Morse	--	28	29	19	29	26	86
AC Navigator	--	--	--	--	27	27	82
Plaza	--	27	27	18	25	24	80
YU89475	--	--	--	--	25	25	76

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

Table 10. Relative protein contents of durum varieties as compared to Renville when grown under dryland continuous cropping at the EARC, Sidney, Montana.

Cultivar	1997	1998	1999	2000	2001	Ave	as % of Renville
AC Avonlea	--	--	--	14.7	14.6	14.7	108.5
AC Morse	--	15.5	15.2	15.2	14.6	15.1	105.0
Maier	--	16.4	15.5	14.3	14.2	15.1	104.9
AC Melita	--	15.6	15.2	14.6	14.1	14.9	103.3
AC Navigator	--	--	--	--	14.1	14.1	102.9
Kyle	15.0	15.7	15.6	15.2	13.6	15.0	102.9
Ben	15.2	16.0	15.4	14.8	13.6	15.0	102.7
Belzer	--	15.8	15.0	13.6	14.1	14.6	101.6
AC Napoleon	--	--	--	--	13.9	13.9	101.5
YU89475	--	--	--	--	13.9	13.9	101.5
Renville	15.4	15.2	15.4	13.3	13.7	14.6	100.0
Sceptre	--	--	15.0	13.7	13.7	14.1	100.0
Lebsock	--	--	15.5	13.9	12.9	14.1	99.8
Plaza	--	15.5	14.2	14.0	13.2	14.2	98.8
Mountrail	--	15.6	14.8	13.5	12.9	14.2	98.6
AC Pathfinder	--	--	--	--	13.5	13.5	98.5
Pierce	--	--	--	--	13.4	13.4	97.8

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 11. Agronomic data obtained from a dryland recrop barley yield trial conducted at the Eastern Agricultural Research Center, Sidney, MT.

Planting date: 30 April 2001 Harvest date: 9 August 2001

Variety	Days to heading ¹	Height, inches	Protein content	Test wt, lb/bu	Yield bu/acre
Baronesse	61	23	10.0	48.5	72.0
MT960228	60	25	8.5	47.8	71.8
Xena	59	26	8.8	48.7	67.7
MTLB 13	60	25	10.3	48.8	67.4
Gallatin	60	28	11.0	49.0	67.1
MT960099	61	23	8.8	47.5	66.3
Valier	61	26	10.2	49.7	65.9
Lewis	61	27	10.2	48.5	63.4
Haxby	58	25	8.8	49.8	63.3
MT970116	58	28	9.7	48.7	62.9
Conlon	57	26	9.3	46.8	62.9
MTLB 5	61	25	9.5	49.0	62.6
MT960100	62	24	9.5	48.7	62.6
Harrington	63	25	9.8	47.0	60.8 x
Stark	57	28	9.4	48.7	60.2 x
H3860224	63	24	9.4	46.5	53.9 x
mean	60	26	9.6	48.4	64.4
probability	<0.01	<0.01	>0.05	<0.01	<0.01
CV (S/mean)	0.5	4.4	8.9	1.8	5.5
LSD _{0.05}	1.4	1.9	ns	1.5	5.9

Check variety is Gallatin with an average yield of 67.1 bu/acre.

x indicates significantly lower yield than check variety, Gallatin, at a probability of <0.05

¹ Heading date is number of days from planting

Table 12. Relative yields of barley varieties compared to Gallatin when grown under dryland continuous cropping at the EARC, Sidney, Montana.

Cultivar	1997	1998	1999	2000	2001	Ave	as % of Gallatin
MT960228	--	--	94.1	25.9	71.8	63.9	107.7
MTLB 13	--	--	97.5	24.1	67.4	63.0	106.1
Xena	--	--	88.7	26.1	67.7	60.8	102.5
Valier	--	53.7	97.9	25.2	65.9	60.7	102.2
Gallatin	46.4	59.3	85.2	25.8	67.1	56.8	100.0
Baronesse	48.1	49.7	87.3	26.4	72.0	56.7	99.9
Lewis	42.3	58.1	93.0	26.3	63.4	56.6	99.8
MT960099	--	--	--	26.3	66.3	46.3	99.7
MTLB 5	--	54.9	92.0	24.4	62.6	58.5	98.5
Harrington	45.0	52.6	93.3	21.8	60.8	54.7	96.4
MT970116	--	--	--	--	62.9	62.9	93.7
Conlon	--	--	--	--	62.9	62.9	93.7
MT960100	--	--	--	20.3	62.6	41.5	89.2
Stark	38.1	55.8	73.9	23.7	60.2	50.3	88.7
H3860224	--	--	--	--	53.9	53.9	80.3
Haxby	--	--	50.8	26.0	63.3	46.7	78.7

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 13. Relative test weights of barley varieties compared to Gallatin when grown under dryland continuous cropping at the EARC, Sidney, Montana.

Cultivar	1997	1998	1999	2000	2001	Ave	as % of Gallatin
Haxby	--	--	50.8	52.8	49.8	51.1	101.6
MTLB 5	--	51.3	49.9	52.3	49.0	50.6	100.6
Lewis	50.0	50.8	49.8	53.5	48.5	50.5	100.4
Stark	50.5	51.8	48.5	52.8	48.7	50.5	100.3
Gallatin	50.3	50.2	48.7	53.3	49.0	50.3	100.0
Valier	--	50.5	48.9	52.0	49.7	50.3	100.0
MT970116	--	--	--	--	48.7	48.7	99.4
Baronesse	49.5	48.7	48.8	52.2	48.5	49.5	98.5
MT960100	--	--	--	52.0	48.7	50.4	98.4
MTLB 13	--	--	48.2	51.3	48.8	49.4	98.2
MT960228	--	--	48.1	52.3	47.8	49.4	98.1
Xena	--	--	48.0	52.3	46.7	49.0	97.4
MT960099	--	--	--	51.5	47.5	49.5	96.8
Conlon	--	--	--	--	46.8	46.8	95.5
H3860224	--	--	--	--	46.5	46.5	94.9
Harrington	47.5	46.2	46.4	51.5	47.0	47.7	94.9

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.

Table 14. Relative heights of barley varieties in inches compared to Gallatin when grown under dryland continuous cropping at the EARC, Sidney, Montana.

Cultivar	1997	1998	1999	2000	2001	Ave	as % of Gallatin
Stark	17	30	31	18	28	25	100.8
Gallatin	18	28	31	18	28	25	100.0
MT970116	--	--	--	--	28	28	100.0
Lewis	19	27	28	16	27	23	95.1
Xena	--	--	29	17	26	24	93.5
Valier	--	26	31	15	26	25	93.3
Conlon	--	--	--	--	26	26	92.9
MT960228	--	--	30	16	25	24	92.2
Harrington	18	25	29	15	25	22	91.1
Haxby	--	--	28	17	25	23	90.9
MTLB 5	--	25	30	15	25	24	90.5
MTLB 13	--	--	28	15	25	23	88.3
Baronesse	18	23	28	15	23	21	87.0
H3860224	--	--	--	--	24	24	85.7
MT960100	--	--	--	14	24	19	82.6
MT960099	--	--	--	12	23	18	76.1

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

Table 15. Relative protein contents of barley varieties compared to Gallatin when grown under dryland continuous cropping at the EARC, Sidney, Montana.

Cultivar	1997	1998	1999	2000	2001	Ave	as % of Gallatin
Valier	--	10.9	11.8	12.2	10.2	11.3	101.3
Baronesse	12.3	11.0	12.0	12.2	10.0	11.5	100.9
Lewis	12.9	11.1	11.8	11.5	10.2	11.5	100.9
MTLB 13	--	--	11.7	12.4	10.3	11.5	100.6
Harrington	12.5	10.8	11.7	12.4	9.8	11.4	100.4
Gallatin	12.5	10.3	11.8	11.4	11.0	11.4	100.0
MTLB 5	--	10.8	11.5	12.3	9.5	11.0	99.1
MT960100	--	--	--	11.9	9.5	10.7	95.5
Stark	12.4	10.4	11.9	10.3	9.4	10.9	95.4
MT960099	--	--	--	11.9	8.8	10.4	92.4
Xena	--	--	10.8	11.0	8.8	10.2	89.5
MT960228	--	--	11.3	10.7	8.5	10.2	89.2
MT970116	--	--	--	--	9.7	9.7	88.2
Haxby	--	--	10.9	10.4	8.8	10.0	88.0
H3860224	--	--	--	--	9.4	9.4	85.5
Conlon	--	--	--	--	9.3	9.3	84.5

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.

Table 16. Agronomic data obtained from a dryland recrop oat yield trial conducted at the Eastern Agricultural Research Center, Sidney, MT.

Planting date: 30 April 2001 Harvest date: 9 August 2001

Variety	Days to heading ¹	Height, inches	Protein content	Test wt, lb/bu	Yield bu/acre
Celsia	63	32	9.7	34.5	101.0
Monida	63	31	10.3	36.0	100.4
CDC Pacer	61	30	10.1	36.2	96.8
87Ab4983	56	23	10.7	36.5	95.9
87Ab5125	62	25	10.4	36.0	95.8
ABSP 9-2	58	28	11.1	37.3	95.8
Rio Grande	56	26	10.8	35.7	92.8
Otana	62	36	11.0	38.0	91.9
Killdeer	57	28	10.7	36.0	91.1
Whitestone	62	26	11.2	35.2	91.1
90Ab1322	60	23	11.1	36.5	90.8
Ajay	62	23	12.1	34.7	89.0
ABSP 19-9	62	26	10.7	36.0	85.5
89Ab4088	58	26	12.2	36.2	81.6
Mean	60	27	10.9	36.0	92.8
probability	<0.01	<0.01	<0.01	<0.01	>0.05
CV (S/mean)	0.4	6.2	6.3	2.3	10.7
LSD _{0.05}	1.2	2.8	1.1	1.4	ns

Check variety is Otana with an average yield of 91.9 bu/acre.

¹ Heading date is number of days from planting

Table 17. Relative yields of oat varieties compared to Otana when grown under dryland continuous cropping at the EARC, Sidney, Montana.

Cultivar	1997	1998	1999	2000	2001	Ave	as % of Otana
CDC Pacer	--	--	--	--	96.8	96.8	105.3
87Ab4983	--	--	--	--	95.9	95.9	104.4
Monida	93.5	95.9	136.2	37.6	100.4	92.7	103.5
Whitestone	87.5	97.7	132.7	48.6	91.1	91.5	102.2
Killdeer	--	--	--	42.6	91.1	66.9	100.3
Otana	83.5	103.8	127.2	41.4	91.9	89.6	100.0
ABSP19-9	--	--	129.6	42.3	85.5	85.8	98.8
ABSP 9-2	74.9	93.4	136.2	41.5	95.8	88.4	98.7
Celcia	92.7	81.9	128.0	34.0	101.0	87.5	97.7
87AB5125	88.8	91.0	128.0	33.1	95.8	87.3	97.5
Rio Grande	72.5	102.9	128.7	38.4	92.8	87.1	97.2
90AB1322	83.6	85.6	124.9	37.4	90.8	84.5	94.3
89Ab4088	--	--	--	--	81.6	81.6	88.8
Ajay	70.4	82.0	112.8	30.2	89.0	76.9	85.8

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.

Table 18. Relative test weights of oat varieties as compared to Otana when grown under dryland continuous cropping at the EARC, Sidney, Montana.

Cultivar	1997	1998	1999	2000	2001	Ave	as % of Otana
Otana	32.8	33.0	38.5	39.0	38.0	36.3	100.0
ABSP 9-2	31.5	31.3	38.5	39.2	37.3	35.6	98.1
ABSP19-9	--	--	36.5	38.7	36.0	37.1	96.3
87Ab4983	--	--	--	--	36.5	36.5	96.1
CDC Pacer	--	--	--	--	36.2	36.2	95.3
89Ab4088	--	--	--	--	36.2	36.2	95.3
Killdeer	--	--	--	37.3	36.0	36.7	95.2
Whitestone	31.5	30.3	36.8	37.5	35.2	34.3	94.5
87AB5125	30.7	29.8	37.7	36.5	36.0	34.1	94.2
Rio Grande	30.8	30.5	36.0	36.7	35.7	33.9	93.6
90AB1322	29.7	28.5	36.5	38.2	36.5	33.9	93.4
Monida	31.8	28.2	36.0	37.0	36.0	33.8	93.2
Ajay	31.0	30.0	35.3	37.2	34.7	33.6	92.8
Celcia	29.5	29.7	35.8	36.7	34.5	33.2	91.7

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 19. Relative heights of oat varieties as compared to Otana when grown under dryland continuous cropping at the EARC, Sidney, Montana.

Cultivar	1997	1998	1999	2000	2001	Ave	as % of Otana
Otana	27	35	38	20	36	31.2	100.0
Celcia	28	31	34	18	32	28.6	91.7
Monida	27	32	35	16	31	28.2	90.4
CDC Pacer	--	--	--	--	30	30.0	83.3
ABSP 9-2	23	28	31	19	28	25.8	82.7
Killdeer	--	--	--	18	28	23.0	82.1
Whitestone	23	28	33	17	26	25.4	81.4
ABSP19-9	--	--	31	16	26	24.3	77.7
Rio Grande	20	29	29	17	26	24.2	77.6
87AB5125	22	25	28	14	25	22.8	73.1
89Ab4088	--	--	--	--	26	26.0	72.2
90AB1322	21	25	27	16	23	22.4	71.8
Ajay	19	23	25	14	23	20.8	66.7
87Ab4983	--	--	--	--	23	23.0	63.9

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

Table 20. Relative protein contents of oat varieties as compared to Otana when grown under dryland continuous cropping at the EARC, Sidney, Montana.

Cultivar	1997	1998	1999	2000	2001	Ave	as % of Otana
89Ab4088	--	--	--	--	12.2	12.2	110.9
Ajay	13.6	12.4	12.8	12.4	12.1	12.7	109.7
Rio Grande	13.2	11.2	13.0	10.5	10.8	11.7	101.7
90AB1322	12.4	11.4	12.8	10.2	11.1	11.6	100.3
ABSP19-9	--	--	12.5	10.8	10.7	11.3	100.3
Otana	12.7	11.1	11.7	11.2	11.0	11.5	100.0
87Ab4983	--	--	--	--	10.7	10.7	97.3
Monida	11.7	11.1	12.2	10.8	10.3	11.2	97.2
Whitestone	11.7	10.8	11.6	10.7	11.2	11.2	97.1
ABSP 9-2	11.8	11.3	11.8	9.7	11.1	11.1	96.5
87AB5125	12.1	11.2	11.1	10.8	10.4	11.1	96.4
Killdeer	--	--	--	10.5	10.7	10.6	95.5
Celcia	11.6	11.0	11.1	10.1	9.7	10.7	92.7
CDC Pacer	--	--	--	--	10.1	10.1	91.8

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.