PROJECT TITLE: Evaluation of spring wheat, durum, barley, and oat varieties under minimum-till, continuous cropping conditions – 2000

PROJECT LEADER:
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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 for yield, test weight, and protein determinations. PREVIOUS CROPS: 1998 - spring wheat, 1997 - safflower, 1996 - small grain plots
SOIL TYPE: Williams clay loam
PREVIOUS CROPS: 1999 - spring wheat, 1998 - safflower, 1997 - small grain plots
RESIDUAL SOIL N TO 3 FT: 48 lb/acre
RESIDUAL SOIL P TO 6 IN: 45 ppm
RESIDUAL SOIL K TO 6 IN: 310 ppm
APPLIED FERTILIZER: 100 lb/ac 18-46-0 applied
HERBICIDES: 2 pt/ac Bronate applied 22 May 2000

PRECIPITATION APR-AUG, 2000: 10.49
AVE (52 yr) PRECIPITATION APR-AUG: 9.46
PRECIPITATION OCT 1999 – SEP 2000: 13.93
AVE (52 yr) PRECIPITATION OCT-SEP: 13.82

Planting dates in 2000 were

Crop	Planting date	Harvest date
Spring wheat	21 April	4 August
Durum	21 April	4 August
Barley	21 April	4 August
Oats	21 April	1 August

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: Seventeen lines and varieties of spring wheat were tested under dryland recrop conditions (Table 1). Reeder yielded the most, although there were no significant differences in

yield among varieties. Average yield was 15.3 bu/acre. Five-year summaries for yield, test weight, height, and protein content are shown in Tables 2 through 5.

Durum: Twenty-three durum varieties were tested under dryland recrop conditions (Table 6). AC Avonlea, AC Morse, and Utopia yielded significantly more than the check variety, Renville. Average yield was 14.3 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). Hector yielded the most, and four entries yielded significantly less than the check variety, Gallatin. Average yield was 24.5 bu/acre. Five-year summaries for yield, test weight, height, and protein content are shown in Tables 12 through 15.

Oats: Sixteen oat varieties were tested under dryland recrop conditions (Table 16). Whitestone yielded significantly more than the check variety, Otana. Eight entries yielded significantly less than the check variety, Otana. Average yield was 34.1 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 1999.

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: 21 April 2000 Harvest date: 4 August 2000

Variety	Days to heading [1]	Height, inches	Protein content	Test wt, lb/bu	Yield bu/acre[2]
Reeder	56	20	14.8	63.0	17.0
Conan	55	19	14.1	62.9	16.5
McVey	60	18	12.3	60.4	16.2
Parshall	57	18	14.2	63.0	16.0
Scholar	58	18	14.0	62.6	15.8
Ernest	56	21	14.6	62.7	15.8
Amidon	57	18	14.6	61.8	15.8
McNeal	58	20	14.5	61.1	15.6
Alsen	56	18	14.7	63.2	15.4
ID377	55	19	13.9	62.2	15.3
Bounty	55	17	13.8	62.2	15.2
MTHW9420	53	18	12.7	61.3	15.2
Verde	59	18	14.0	61.8	14.6
Argent	56	20	14.7	62.5	13.8
MTHW9710	53	19	14.0	60.7	13.7
ND709-9	57	21	15.4	63.1	13.7
MT9955	58	18	13.1	60.6	13.7
mean	56	19	14.1	62.1	15.3
probability	<0.001	0.289	<0.001	<0.001	0.660
CV (S/mean)	1.5	9.4	4.0	0.7	12.9
$LSD_{0.05}$	1.4	ns	0.9	0.7	ns

Check variety is McNeal with an average yield of 15.6 bu/acre.
* 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	1996	1997	1998	1999	2000	Ave	as % of McNeal
McVey	--	--	--	62.3	16.2	39.3	125.0
Reeder	--	--	42.6	53.3	17.0	37.6	111.6
Scholar	14.0	32.2	37.7	49.8	15.8	29.9	108.1
377S	--	--	--	52.2	15.3	33.8	107.5
Amidon	13.1	30.8	37.3	50.1	15.8	29.4	106.4
Parshall	--	--	35.4	54.6	16.0	35.3	104.7
Conan	--	--	--	48.2	16.5	32.4	103.0
Argent	--	--	33.6	54.9	13.8	34.1	101.1
McNeal	11.8	25.3	38.4	47.2	15.6	27.7	100.0
Alsen	--	--	--	--	15.4	15.4	98.7
Ernest	12.1	24.0	32.8	50.5	15.8	27.0	97.8
Bounty	--	--	--	--	15.2	15.2	97.4
Verde	--	--	--	--	14.6	14.6	93.6
MTHW9420	--	13.4	36.0	50.2	15.2	28.7	90.8
MTHW9710	--	--	--	--	13.7	13.7	87.8
ND709-9	--	--	--	--	13.7	13.7	87.8
MT9955	--	--	--	--	13.7	13.7	87.8

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	1996	1997	1998	1999	2000	Ave	as % of McNeal
Scholar	60.3	59.7	59.3	61.7	62.6	60.7	104.3
Parshall	--	--	58.7	63.0	63.0	61.6	103.8
Ernest	59.8	58.3	58.2	62.2	62.7	60.2	103.5
Alsen	--	--	--	--	63.2	63.2	103.4
ND709-9	--	--	--	--	63.1	63.1	103.3
Conan	--	--	--	61.5	62.9	62.2	103.0
Amidon	59.4	58.8	57.2	60.5	61.8	59.5	102.3
Argent	--	--	57.3	62.0	62.5	60.6	102.1
377S	--	--	--	60.8	62.2	61.5	101.8
Bounty	--	--	--	--	62.2	62.2	101.8
Reeder	--	--	57.0	61.2	63.0	60.4	101.8
Verde	--	--	--	--	61.8	61.8	101.1
MTHW9420	--	59.2	55.0	61.2	61.3	59.2	100.6
McNeal	55.6	57.4	57.2	59.7	61.1	58.2	100.0
McVey	--	--	--	60.2	60.4	60.3	99.8
MTHW9710	--	--	--	--	60.7	60.7	99.3
MT9955	--	--	--	--	60.6	60.6	99.2

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	1996	1997	1998	1999	2000	Ave	as % of McNeal
Amidon	27.0	21.0	33.0	36.0	18.0	27.0	111.6
Ernest	23.0	21.0	33.0	34.0	21.0	26.4	109.1
ND709-9	--	--	--	--	21.0	21.0	105.0
Scholar	22.0	21.0	31.0	35.0	18.0	25.4	105.0
Parshall	--	--	32.0	34.0	18.0	28.0	102.4
McNeal	21.0	18.0	32.0	30.0	20.0	24.2	100.0
Argent	--	--	31.0	31.0	20.0	27.3	100.0
377S	--	--	--	30.0	19.0	24.5	98.0
Conan	--	--	--	30.0	19.0	24.5	98.0
Reeder	--	--	30	29	20	26.3	96.3
McVey	--	--	--	30.0	18.0	24.0	96.0
MTHW9710	--	--	--	--	19.0	19.0	95.0
Alsen	--	--	--	--	18.0	18.0	90.0
Verde	--	--	--	--	18.0	18.0	90.0
MT9955	--	--	--	--	18.0	18.0	90.0
MTHW9420	--	16.0	27.0	28.0	18.0	22.3	89.0
Bounty	--	--	--	--	17.0	17.0	85.0

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	1996	1997	1998	1999	2000	Ave	as % of McNeal
Parshall	--	--	15.8	15.1	14.2	15.0	111.9
Argent	--	--	15.7	14.5	14.7	15.0	111.4
Reeder	--	--	15.2	14.8	14.8	14.9	111.2
ND709-9	--	--	--	--	15.4	15.4	106.2
Ernest	18.1	15.8	15.4	14.4	14.6	15.7	105.0
Alsen	--	--	--	--	14.7	14.7	101.4
Scholar	17.3	15.7	14.9	13.0	14.0	15.0	100.4
McNeal	17.8	16.5	14.1	11.7	14.5	14.9	100.0
Amidon	16.6	14.9	14.2	13.0	14.6	14.7	98.3
Conan	--	--	--	11.6	14.1	12.9	98.1
377S	--	--	--	11.5	13.9	12.7	96.9
Verde	--	--	--	--	14.0	14.0	96.6
MTHW9710	--	--	--	--	14.0	14.0	96.6
MTHW9420	--	16.3	14.9	10.8	12.7	13.7	96.3
Bounty	--	--	--	--	13.8	13.8	95.2
McVey	--	--	--	11.7	12.3	12.0	91.6
MT9955	--	--	--	--	13.1	13.1	90.3

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 6. Agronomic data obtained from a dryland recrop durum yield trial conducted at the Eastern Agricultural Research Center, Sidney, MT.
Planting date: 21 April 2000 Harvest date: 4 August 2000

Variety	Days to heading [1]	Height, inches	Protein content	Test wt, lb/bu	Yield bu/acre[2]	
AC Avonlea	57	20	14.7	63.3	17.3	a
AC Morse	56	19	15.2	62.0	16.9	a
Utopia	54	18	13.1	60.9	16.2	a
Mountrail	58	18	13.5	62.3	15.6	
AC Melita	57	19	14.6	62.9	15.3	
McNeal	59	20	13.4	61.5	15.2	
Monroe	53	21	14.0	62.1	14.9	
Laker	58	20	12.5	63.2	14.8	
Plenty	58	20	13.9	60.6	14.5	
Maier	57	18	14.3	63.3	14.4	
Vic	57	20	13.7	62.1	14.4	
Munich	56	19	14.0	62.2	14.1	
Medora	56	21	14.6	62.8	13.9	
Lebsock	57	18	13.9	63.0	13.8	
Renville	56	20	13.3	62.6	13.6	
Plaza	59	18	14.0	63.3	13.5	
Ward	56	20	14.1	62.6	13.5	
GM90002	56	19	14.2	62.9	13.4	
Ben	56	21	14.8	62.8	13.4	
Belzer	58	21	13.6	61.8	13.4	
Sceptre	58	20	13.7	62.0	13.1	
Kyle	62	19	15.2	62.4	12.4	
GM90003	55	19	14.0	60.0	12.3	
mean	57	19	14.0	62.3	14.3	
probability	<0.01	>0.05	<0.01	0.05-0.01	<0.01	
CV (S/mean)	0.4	7.4	2.7	1.6	9.3	
$LSD_{0.05}$	1.3	ns	0.6	1.6	2.2	

Check variety is Renville with an average yield of 13.6 bu/acre.

[1] Heading date is number of days from planting
[2] a indicates significantly greater yield than check variety, Renville, at a probability of <0.05

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

Cultivar	1996	1997	1998	1999	2000	Ave	as % of Renville
AC Avonlea	--	--	--	--	17.3	17.3	127.2
AC Morse	--	--	35.8	58.7	16.9	37.1	104.7
Kyle	15.5	31.7	33.0	54.7	12.4	29.5	104.1
Mountrail	--	--	33.7	61.2	15.6	36.8	103.9
Utopia	--	--	--	57.2	16.2	36.7	102.4
Plenty	13.7	25.7	33.0	56.5	14.5	28.7	101.3
Renville	13.8	21.3	34.7	58.1	13.6	28.3	100.0
Maier	--	--	34.2	57.2	14.4	35.3	99.4
Plaza	--	--	36.1	55.4	13.5	35.0	98.7
GM90002	--	--	--	--	13.4	13.4	98.5
Laker	15.1	23.4	--	51.7	14.8	26.3	98.3
Ben	14.6	23.0	33.4	54.6	13.4	27.8	98.2
AC Melita	--	--	34.2	53.7	15.3	34.4	97.0
Ward	14.5	22.5	--	52.5	13.5	25.8	96.4
Medora	13.5	24.6	--	49.9	13.9	25.5	95.4
Sceptre	--	--	--	55.2	13.1	34.2	95.3
Munich	13.8	21.6	32.8	50.4	14.1	26.5	93.8
Vic	12.6	25.4	30.6	48.4	14.4	26.3	92.9
Lebsock	--	--	--	51.4	13.8	32.6	90.9
GM90003	--	--	--	--	12.3	12.3	90.4
Monroe	14.2	15.7	33.9	48.2	14.9	25.4	89.7
Belzer	--	--	29.2	49.7	13.4	30.8	86.7

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

Cultivar	1996	1997	1998	1999	2000	Ave	as % of Renville
Lebsock	--	--	--	59.5	63.0	61.3	101.2
AC Avonlea	--	--	--	--	63.3	63.3	101.1
Laker	61.2	59.3	--	59.0	63.2	60.7	100.9
Ward	60.8	60.2	--	58.8	62.6	60.6	100.7
GM90002	--	--	--	--	62.9	62.9	100.5
Medora	61.1	59.1	--	58.5	62.8	60.4	100.4
Ben	61.7	59.9	59.2	58.2	62.8	60.4	100.3
Maier	--	--	59.2	59.3	63.3	60.6	100.3
Renville	60.0	59.6	60.3	58.4	62.6	60.2	100.0
Vic	59.4	59.2	60.2	58.6	62.1	59.9	99.5
Monroe	59.7	59.9	58.8	58.7	62.1	59.8	99.4
Kyle	60.6	58.7	59.0	57.9	62.4	59.7	99.2
Munich	59.7	59.7	58.3	58.5	62.2	59.7	99.2
AC Melita	--	--	58.2	58.2	62.9	59.8	98.9
Plaza	--	--	57.7	58.3	63.3	59.8	98.9
AC Morse	--	--	58.8	57.8	62.0	59.5	98.5
Sceptre	--	--	--	57.0	62.0	59.5	98.3
Plenty	59.7	58.3	58.8	58.1	60.6	59.1	98.2
Mountrail	--	--	58.0	57.7	62.3	59.3	98.2
Utopia	--	--	--	57.5	60.9	59.2	97.9
Belzer	--	--	56.8	56.1	61.8	58.2	96.4
GM90003	--	--	--	--	60.0	60.0	95.8

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	1996	1997	1998	1999	2000	Ave	as % of Renville
Plenty	28	19	34	38	20	27.8	106.9
Kyle	24	21	35	38	19	27.4	105.4
Vic	26	21	32	36	20	27.0	103.8
Medora	25	18	--	34	21	24.5	101.0
Renville	24	17	33	36	20	26.0	100.0
Ward	24	17	--	36	20	24.3	100.0
AC Avonlea	--	--	--	--	20	20.0	100.0
Belzer	--	--	31	36	21	29.3	98.9
Ben	23	17	30	35	21	25.2	96.9
Monroe	24	17	31	33	21	25.2	96.9
GM90002	--	--	--	--	19	19.0	95.0
GM90003	--	--	--	--	19	19.0	95.0
Mountrail	--	--	30	36	18	28.0	94.4
AC Melita	--	--	31	33	19	27.7	93.3
Sceptre	--	--	--	32	20	26.0	92.9
Laker	23	16	--	30	20	22.3	91.8
Lebsock	--	--	--	32	18	25.0	89.3
Maier	--	--	29	31	18	26.0	87.6
AC Morse	--	--	28	29	19	25.3	85.4
Munich	21	14	28	28	19	22.0	84.6
Plaza	--	--	27	27	18	24.0	80.9
Utopia	--	--	--	24	18	21.0	75.0

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	1996	1997	1998	1999	2000	Ave	as % of Renville
AC Avonlea	--	--	--	--	14.7	14.7	110.5
GM90002	--	--	--	--	14.2	14.2	106.8
GM90003	--	--	--	--	14.0	14.0	105.3
Maier	--	--	16.4	15.5	14.3	15.4	105.2
AC Morse	--	--	15.5	15.2	15.2	15.3	104.6
AC Melita	--	--	15.6	15.2	14.6	15.1	103.4
Kyle	19.7	15.0	15.7	15.6	15.2	16.2	102.8
Lebsock	--	--	--	15.5	13.9	14.7	102.4
Ben	19.1	15.2	16.0	15.4	14.8	16.1	101.9
Medora	19.5	15.2	--	15.4	14.6	16.2	101.4
Munich	19.5	15.2	15.8	15.6	14.0	16.0	101.4
Belzer	--	--	15.8	15.0	13.6	14.8	101.1
Renville	19.7	15.4	15.2	15.4	13.3	15.8	100.0
Mountrail	--	--	15.6	14.8	13.5	14.6	100.0
Plenty	18.8	15.3	15.7	15.3	13.9	15.8	100.0
Vic	19.7	15.1	15.2	15.3	13.7	15.8	100.0
Sceptre	--	--	--	15.0	13.7	14.4	100.0
Plaza	--	--	15.5	14.2	14.0	14.6	99.5
Monroe	17.8	15.5	15.5	15.5	14.0	15.7	99.1
Ward	18.4	14.6	--	15.5	14.1	15.7	98.1
Utopia	--	--	--	13.8	13.1	13.5	93.7
Laker	18.2	13.9	--	13.4	12.5	14.5	90.9

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.

Table 11. Agronomic data obtained from a dryland recrop barley yield trial conducted at the Eastern Agricultural Research Center, Sidney, MT.
Planting date: 21 April 2000 Harvest date: 4 August 2000

Variety	Days to heading [1]	Height, inches	Protein content	Test wt, lb/bu	Yield bu/acre[2]	
Hector	59	18	12.3	53.2	26.7	
Baronesse	59	15	12.2	52.2	26.4	
Lewis	59	16	11.5	53.5	26.3	
MT960099	59	12	11.9	51.5	26.3	
Xena	60	17	11.0	52.3	26.1	
MT950186	56	17	10.4	52.8	26.0	
MT960228	59	16	10.7	52.3	25.9	
Gallatin	60	18	11.4	53.3	25.8	
Valier	60	15	12.2	52.0	25.2	
MTLB 5	61	15	12.3	52.3	24.4	
MTLB 13	60	15	12.4	51.3	24.1	
Stark	54	18	10.3	52.8	23.7	
Bowman	54	17	11.0	51.3	22.0	x
Harrington	60	15	12.4	51.5	21.8	x
Chinook	59	16	12.6	53.0	21.7	x
MT960100	61	14	11.9	52.0	20.3	x
mean	59	16	11.6	52.3	24.5	
probability	<0.01	<0.01	<0.01	0.05-0.01	<0.01	
CV (S/mean)	0.4	6.2	4.4	1.7	8.3	
$LSD_{0.05}$	1.2	4.2	0.8	1.5	3.4	

Check variety is Gallatin with an average yield of 25.8 bu/acre.

[1] Heading date is number of days from planting
[2] x indicates significantly lower yield than check variety, Gallatin, at a probability of <0.05

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

Cultivar	1996	1997	1998	1999	2000	Ave	as % of Gallatin
MTLB 13	--	--	--	97.5	24.1	60.8	109.5
MT960228	--	--	--	94.1	25.9	60.0	108.1
Hector	18.8	44.0	58.4	97.1	26.7	49.0	105.3
Valier	--	--	53.7	97.9	25.2	58.9	103.8
Xena	--	--	--	88.7	26.1	57.4	103.4
MT960099	--	--	--	--	26.3	26.3	101.9
Lewis	16.4	42.3	58.1	93.0	26.3	47.2	101.5
MTLB 5	--	--	54.9	92.0	24.4	57.1	100.6
Gallatin	15.9	46.4	59.3	85.2	25.8	46.5	100.0
Chinook	17.2	39.9	62.8	89.6	21.7	46.2	99.4
Baronesse	18.5	48.1	49.7	87.3	26.4	46.0	98.9
Harrington	15.8	45.0	52.6	93.3	21.8	45.7	98.2
Bowman	23.2	39.0	53.5	81.9	22.0	43.9	94.4
Stark	19.6	38.1	55.8	73.9	23.7	42.2	90.8
MT960100	--	--	--	--	20.3	20.3	78.7
MT950186	--	--	--	50.8	26.0	38.4	69.2

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.

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

Cultivar	1996	1997	1998	1999	2000	Ave	as % of Gallatin
MT950186	--	--	--	50.8	52.8	51.8	101.6
Lewis	48.2	50.0	50.8	49.8	53.5	50.5	101.4
Stark	48.1	50.5	51.8	48.5	52.8	50.3	101.2
MTLB 5	--	--	51.3	49.9	52.3	51.2	100.9
Bowman	49.8	50.0	50.5	49.0	51.3	50.1	100.8
Hector	46.5	50.2	49.7	49.3	53.2	49.8	100.1
Gallatin	46.2	50.3	50.2	48.7	53.3	49.7	100.0
Valier	--	--	50.5	48.9	52.0	50.5	99.5
Baronesse	47.4	49.5	48.7	48.8	52.2	49.3	99.2
Chinook	47.1	48.3	48.5	48.6	53.0	49.1	98.7
MT960228	--	--	--	48.1	52.3	50.2	98.4
Xena	--	--	--	48.0	52.3	50.2	98.3
MT960100	--	--	--	--	52.0	52.0	97.6
MTLB 13	--	--	--	48.2	51.3	49.8	97.5
MT960099	--	--	--	--	51.5	51.5	96.6
Harrington	46.2	47.5	46.2	46.4	51.5	47.6	95.6

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

Cultivar	1996	1997	1998	1999	2000	Ave	as % of Gallatin
Hector	20	19	29	29	18	23.0	100.9
Stark	19	17	30	31	18	23.0	100.9
Gallatin	19	18	28	31	18	22.8	100.0
Chinook	17	17	27	32	16	21.8	95.6
Bowman	19	17	27	29	17	21.8	95.6
Lewis	18	19	27	28	16	21.6	94.7
MT960228	--	--	--	30	16	23.0	93.9
Xena	--	--	--	29	17	23.0	93.9
Valier	--	--	26	31	15	24.0	93.5
Harrington	18	18	25	29	15	21.0	92.1
MT950186	--	--	--	28	17	22.5	91.8
MTLB 5	--	--	25	30	15	23.3	90.9
Baronesse	17	18	23	28	15	20.2	88.6
MTLB 13	--	--	--	28	15	21.5	87.8
MT960100	--	--	--	--	14	14.0	77.8
MT960099	--	--	--	--	12	12.0	66.7

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	1996	1997	1998	1999	2000	Ave	as % of Gallatin
Chinook	15.3	12.7	11.3	12.2	12.6	12.8	104.9
MT960099	--	--	--	--	11.9	11.9	104.4
MT960100	--	--	--	--	11.9	11.9	104.4
Valier	--	--	10.9	11.8	12.2	11.6	104.2
MTLB 13	--	--	--	11.7	12.4	12.1	103.9
MTLB 5	--	--	10.8	11.5	12.3	11.5	103.3
Baronesse	15.4	12.3	11.0	12.0	12.2	12.6	102.9
Harrington	15.1	12.5	10.8	11.7	12.4	12.5	102.3
Hector	14.8	12.3	11.3	11.7	12.3	12.5	102.1
Lewis	14.9	12.9	11.1	11.8	11.5	12.4	101.8
Gallatin	15.1	12.5	10.3	11.8	11.4	12.2	100.0
Bowman	12.9	12.5	11.3	11.7	11.0	11.9	97.2
Stark	13.1	12.4	10.4	11.9	10.3	11.6	95.1
MT960228	--	--	--	11.3	10.7	11.0	94.8
Xena	--	--	--	10.8	11.0	10.9	94.0
MT950186	--	--	--	10.9	10.4	10.7	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.

Table 16. Agronomic data obtained from a dryland recrop oat yield trial conducted at the Eastern Agricultural Research Center, Sidney, MT, 1995.
Planting date: 21 April 2000 Harvest date: 1 August 2000

Variety	Days to heading [1]	Height, inches	Protein content	Test wt, lb/bu	Yield bu/acre[2]	
Whitestone	59	17	10.7	37.5	48.6	a
ND930122	58	18	10.5	37.3	42.6	
ABSP19-9	59	16	10.8	38.7	42.3	
ABSP9-2	58	19	9.7	39.2	41.5	
Otana	59	20	11.2	39.0	41.4	
Rio Grande	55	17	10.5	36.7	38.4	
Monida	61	16	10.8	37.0	37.6	
90Ab1322	59	16	10.2	38.2	37.4	
Celcia	62	18	10.1	36.7	34.0	x
87Ab5125	61	14	10.8	36.5	33.1	x
Ajay	61	14	12.4	37.2	30.2	x
AC Belmont*	61	18	11.4	43.3	30.1	x
95A11633*	61	16	12.6	43.4	24.7	x
Paul*	61	19	13.3	46.4	23.5	x
Provena*	60	17	14.0	48.8	20.5	x
Lamont*	61	17	12.9	43.3	20.1	x
Mean	60	17	11.4	39.9	34.1	
probability	0.01	<0.01	<0.01	<0.01	<0.01	
CV (S/mean)	1.2	8.7	5.8	2.1	11.9	
$LSD_{0.05}$	3.3	2.5	1.1	1.4	6.8	

Check variety is Otana with an average yield of 41.4 bu/acre.
*hulless varieties

[1] Heading date is number of days from planting
[2] a indicates significantly greater yield than check variety, Otana, at a probability of <0.05
x indicates significantly lower yield than check variety, Otana, at a probability of <0.05

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

Cultivar	1996	1997	1998	1999	2000	Ave	as % of Otana
ND930122	--	--	--	--	42.6	42.6	102.9
ABSP19-9	--	--	--	129.6	42.3	86.0	102.0
Monida	37.2	93.5	95.9	136.2	37.6	80.1	100.0
Otana	44.3	83.5	103.8	127.2	41.4	80.0	100.0
Whitestone	31.5	87.5	97.7	132.7	48.6	79.6	99.5
ABSP 9-2	--	74.9	93.4	136.2	41.5	86.5	97.2
Rio Grande	41.0	72.5	102.9	128.7	38.4	76.7	95.8
87AB5125	--	88.8	91.0	128.0	33.1	85.2	95.8
Celcia	--	92.7	81.9	128.0	34.0	84.2	94.6
90AB1322	30.3	83.6	85.6	124.9	37.4	72.4	90.4
Ajay	38.5	70.4	82.0	112.8	30.2	66.8	83.4
AC Belmont	--	--	--	--	30.1	30.1	72.7
Provena	22.3	--	--	85.2	20.5	42.7	60.1
Lamont	25.9	--	--	81.2	20.1	42.4	59.7
95AB11633	--	--	--	--	24.7	24.7	59.7
Paul	23.2	--	--	73.2	23.5	40.0	56.3

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.

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

Cultivar	1996	1997	1998	1999	2000	Ave	as % of Otana
Provena	44.6	--	--	43.3	48.8	45.6	123.0
Paul	43.7	--	--	43.2	46.4	44.4	120.0
95AB11633	--	--	--	--	43.4	43.4	111.3
AC Belmont	--	--	--	--	43.3	43.3	111.0
Lamont	39.0	--	--	38.5	43.3	40.3	108.7
Otana	33.6	32.8	33.0	38.5	39.0	35.4	100.0
ABSP 9-2	--	31.5	31.3	38.5	39.2	35.1	98.0
ABSP19-9	--	--	--	36.5	38.7	37.6	97.0
ND930122	--	--	--	--	37.3	37.3	95.6
87AB5125	--	30.7	29.8	37.7	36.5	33.7	94.0
Whitestone	29.8	31.5	30.3	36.8	37.5	33.2	93.8
Ajay	31.3	31.0	30.0	35.3	37.2	33.0	93.2
Rio Grande	29.5	30.8	30.5	36.0	36.7	32.7	92.4
Monida	30.2	31.8	28.2	36.0	37.0	32.6	92.3
Celcia	--	29.5	29.7	35.8	36.7	32.9	91.9
90AB1322	28.4	29.7	28.5	36.5	38.2	32.3	91.2

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	1996	1997	1998	1999	2000	Ave	as % of Otana
Otana	27	27	35	38	20	29.4	100.0
Paul	22	--	--	38	19	26.3	92.9
Celcia	--	28	31	34	18	27.8	92.5
ND930122	--	--	--	--	18	18.0	90.0
AC Belmont	--	--	--	--	18	18.0	90.0
Monida	20	27	32	35	16	26.0	88.4
ABSP 9-2	--	23	28	31	19	25.3	84.2
Whitestone	21	23	28	33	17	24.4	83.0
ABSP19-9	--	--	--	31	16	23.5	81.0
95AB11633	--	--	--	--	16	16.0	80.0
Provena	19	--	--	31	17	22.3	78.8
Rio Grande	20	20	29	29	17	23.0	78.2
Lamont	18	--	--	31	17	22.0	77.6
87AB5125	--	22	25	28	14	22.3	74.2
90AB1322	18	21	25	27	16	21.4	72.8
Ajay	14	19	23	25	14	19.0	64.6

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	1996	1997	1998	1999	2000	Ave	as % of Otana
Paul	16.7	--	--	15.1	13.3	15.0	140.1
Provena	15.2	--	--	15.0	14.0	14.7	137.3
Lamont	14.9	--	--	14.3	12.9	14.0	130.7
95AB11633	--	--	--	--	12.6	12.6	112.5
Ajay	10.7	13.6	12.4	12.8	12.4	12.4	110.5
Rio Grande	10.9	13.2	11.2	13.0	10.5	11.8	105.0
90AB1322	10.3	12.4	11.4	12.8	10.2	11.4	102.0
AC Belmont	--	--	--	--	11.4	11.4	101.8
ABSP19-9	--	--	--	12.5	10.8	11.7	101.7
Otana	9.3	12.7	11.1	11.7	11.2	11.2	100.0
Monida	9.4	11.7	11.1	12.2	10.8	11.0	98.6
Whitestone	9.9	11.7	10.8	11.6	10.7	10.9	97.7
87AB5125	--	12.1	11.2	11.1	10.8	11.3	96.8
ABSP 9-2	--	11.8	11.3	11.8	9.7	11.2	95.5
Celcia	--	11.6	11.0	11.1	10.1	11.0	93.8
ND930122	--	--	--	--	10.5	10.5	93.8

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.