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

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

RESULTS:

Previous crop was spring wheat. All yield trials had three replications. Soil type is a Williams loam. Plots were 20 feet long and three rows wide, with one foot between rows. At harvest, all rows were harvested with a plot combine for yield, test weight, and protein determinations.

Residual soil N was 111 lb/acre to three feet and residual soil P was 17.5 lb/acre to six inches. Two hundred lb/acre of 18-46-0 was broadcast in granular form on 26 April 1995. Bronate was applied for weed control at a rate of 2 pt/acre on 16 May 1995.

Spring wheat:

Twenty-five lines and varieties of spring wheat were tested under dryland recrop conditions (Table 1). Hard red wheats Newana and McNeal yielded the most, followed by soft white wheat Vanna. Average yield was 26.0 bu/acre. Five-year summaries for yield, test weight, height, and protein content are shown in Tables 2 through 5.

Durum:

Thirteen durum varieties were tested under dryland recrop conditions (Table 6). Crosby and Sceptre yielded the most. Average yield was 32.8 bu/acre. Five-year summaries for yield, test weight, height, and protein content are shown in Tables 7 through 10.

Barley:

Eighteen barley lines and varieties were tested under dryland recrop conditions (Table 11). Targhee and Montana experimental line MT890008 yielded the most. Average yield was 59.9 bu/acre. Five-year summaries for yield, test weight, height, and protein content are shown in Tables 12 through 15.

Oats:

Nineteen oat varieties were tested under dryland recrop conditions (Table 16). Border, Monida, and Whitestone yielded the most. Average yield was 78.7 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 1995.

Recrop small grain plots were planted on 28 April 1995. Soil moisture was good at planting, and adequate precipitation resulted in yields that were slightly above average. High winds at maturity caused shattering, which resulted in shatter resistant varieties performing better than varieties susceptible to shatter. Spring wheat was harvested 8 August, durum was harvested on 16 August, and barley and oats were harvested on 4 August.

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, 1995.
Planting date: 28 April 1995 Harvest date: 8 August 1995

Variety	Days to heading [1]	Height, inches	Protein content	Test wt, lb/bu	Yield bu/acre
Newana	60	20	15.7	61.3	35.1
McNeal	57	19	16.7	60.3	32.8
Vanna	58	18	13.4	60.3	30.5 x
Stoa	57	21	16.1	60.5	30.4 x
Glenman	59	20	14.8	60.5	29.8 x
Westbred 926	54	19	16.7	60.7	29.2 xx
Grandin	56	20	16.2	61.5	29.0 xx
Hi-Line	54	17	16.9	60.8	28.0 xx
Len	57	20	16.4	61.3	26.7 xx
Lew	60	21	15.6	61.8	26.4 xx
Pondera	56	22	16.3	61.8	26.2 xx
Pioneer 2375	56	19	16.4	61.8	25.1 xx
MT 9354	56	20	15.7	61.6	24.4 xx
Border	55	17	16.0	61.8	24.3 xx
Ernest	56	21	16.9	61.2	24.2 xx
MTHW 9406	53	19	15.2	60.5	24.2 xx
Rambo	58	16	15.7	61.4	24.0 xx
MT 9360	56	19	17.3	61.1	23.9 xx
Trenton	57	20	16.4	62.6	23.8 xx
Amidon	56	19	16.4	59.8	23.4 xx
Westbred 936	54	18	17.5	61.5	23.2 xx
Fergus	55	18	17.0	61.9	23.1 xx
Express	56	15	17.4	60.6	23.0 xx
Kulm	55	19	17.4	63.0	20.4 xx
Fortuna	56	22	17.4	59.9	19.3 xx
mean	56.3	19.2	16.3	61.2	26.0
LSD 0.05	1.11	3.11	0.70	1.08	4.28
LSD 0.01					5.70

[1] Heading date is number of days from planting

Check variety is Newana with an average yield of 35.1 bu/a.
x indicates significantly less than check variety, Newana, at a probability of <0.05
xx indicates significantly less than check variety, Newana, at a probability of <0.01

Table 2. Relative yielding abilities of spring wheat varieties as compared to Newana when grown under dryland continuous cropping conditions at the Eastern Agricultural Research Center, Sidney, Montana, during the 1991-1995 period.

Cultivar	# of years	1991	1992	1993	1994	1995	Ave	as % of Newana
McNeal	4	--	93.6	38.2	36.3	32.8	50.2	114.0
Newana	5	17.1	79.2	30.3	31.7	35.1	38.7	100.0
Glenman	5	18.5	85.6	27.6	31.5	29.8	38.6	99.8
Gus	3	16.8	80.7	28.2	--	--	41.9	99.3
Lew	5	17.7	84.3	30.0	33.2	26.4	38.3	99.1
Rambo	5	18.4	86.6	28.0	33.4	24.0	38.1	98.4
Stoa	5	18.1	81.1	27.9	31.1	30.4	37.7	97.5
Grandin	5	18.4	80.7	29.1	31.2	29.0	37.7	97.4
Amidon	5	24.6	77.6	33.6	28.3	23.4	37.5	96.9
Hi-Line	5	17.3	75.2	30.8	32.7	28.0	36.8	95.1
Len	5	19.2	75.8	27.3	29.1	26.7	35.6	92.1
Lancer	4	17.5	71.0	26.9	29.0	--	36.1	91.2
Westbred 926	5	14.5	71.5	24.2	33.1	29.2	34.5	89.2
Olaf	3	15.6	74.5	22.7	--	--	37.6	89.1
Pondera	5	16.3	64.8	33.6	30.9	26.2	34.4	88.8
Vanna	1	--	--	--	--	30.5	30.5	86.9
Cutless	4	15.1	68.0	24.0	29.9	--	34.2	86.5
Ernest	2	--	--	--	32.3	24.2	28.2	84.6
Kulm	2	--	--	--	36.1	20.4	28.2	84.6
Border	2	--	--	--	25.4	24.3	24.8	74.4
Pioneer 2375	1	--	--	--	--	25.1	25.1	71.5
Fortuna	5	18.0	49.8	20.2	28.2	19.3	27.1	70.1
MT 9354	1	--	--	--	--	24.4	24.4	69.5
MTHW9406	1	--	--	--	--	24.2	24.2	68.9
MT 9360	1	--	--	--	--	23.9	23.9	68.1
Trenton	1	--	--	--	--	23.8	23.8	67.8
Westbred 936	1	--	--	--	--	23.2	23.2	66.1
Fergus	1	--	--	--	--	23.1	23.1	65.8
Express	1	--	--	--	--	23.0	23.0	65.5

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, Newana.

Table 3. Relative test weights of spring wheat varieties as compared to Newana when grown under dryland continuous cropping conditions at the Eastern Agricultural Research Center, Sidney, Montana, during the 1991-1995 period.

Cultivar	# of years	1991	1992	1993	1994	1995	Ave	as % of Newana
Kulm	2	--	--	--	60.7	63.0	61.8	103.0
Trenton	1	--	--	--	--	62.6	62.6	102.1
Pondera	5	59.3	63.3	56.2	60.0	61.8	60.1	101.3
Ernest	2	--	--	--	60.5	61.2	60.8	101.3
Hi-Line	5	58.9	63.5	56.5	60.3	60.8	60.0	101.1
Fergus	1	--	--	--	--	61.9	61.9	101.0
Pioneer 2375	1	--	--	--	--	61.8	61.8	100.8
Grandin	5	59.7	63.3	56.0	58.2	61.5	59.7	100.7
Border	2	--	--	--	59.2	61.8	60.5	100.7
MT 9354	1	--	--	--	--	61.6	61.6	100.5
Rambo	5	59.4	62.3	54.5	60.3	61.4	59.6	100.4
Westbred 936	1	--	--	--	--	61.5	61.5	100.3
Newana	5	58.9	63.0	54.7	58.8	61.3	59.3	100.0
Lew	5	57.8	63.2	55.3	58.3	61.8	59.3	99.9
Lancer	4	57.7	62.7	55.3	59.5	--	58.8	99.9
Cutless	4	59.1	62.8	53.5	59.5	--	58.7	99.8
Westbred 926	5	59.0	62.8	54.0	59.2	60.7	59.1	99.7
MT 9360	1	--	--	--	--	61.1	61.1	99.7
Len		58.4	62.8	54.0	59.0	61.3	59.1	99.6
McNeal	4	--	61.5	56.5	58.5	60.3	59.2	99.6
Olaf	3	59.1	62.0	54.7	--	--	58.6	99.5
Express	1	--	--	--	--	60.6	60.6	98.9
Gus	3	58.8	62.2	53.5	--	--	58.2	98.8
Stoa	5	58.0	62.3	53.2	58.8	60.5	58.6	98.7
MTHW9406	1	--	--	--	--	60.5	60.5	98.7
Vanna	1	--	--	--	--	60.3	60.3	98.4
Fortuna	5	58.3	60.5	52.8	60.0	59.9	58.3	98.2
Amidon	5	57.1	60.5	53.7	58.3	59.8	57.9	97.5
Glenman	5	57.4	61.7	50.7	58.2	60.5	57.7	97.2

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, Newana.

Table 4 . Relative heights of spring wheat varieties as compared to Newana when grown under dryland continuous cropping conditions at the Eastern Agricultural Research Center, Sidney, Montana, during the 1991-1995 period.

Cultivar	# of years	1991	1992	1993	1994	1995	Ave	as % of Newana
Lancer	4	29	35	29	31	--	31.0	122.8
Ernest	2	--	--	--	31	21	26.0	115.6
Lew	5	25	33	29	31	21	27.8	114.9
Fortuna	5	23	34	30	30	22	27.8	114.9
Stoa	5	26	31	29	29	21	27.2	112.4
Amidon	5	25	33	28	30	19	27.0	111.6
Glenman	5	24	31	28	28	20	26.2	108.3
Olaf	3	25	30	27	--	--	27.3	107.9
Grandin	5	24	31	28	26	20	25.8	106.6
Pondera	5	23	29	27	28	22	25.8	106.6
McNeal	4	--	30	28	28	19	26.2	106.1
Len	5	24	30	27	27	20	25.6	105.8
Cutless	5	21	30	27	28	--	26.5	105.0
Kulm	2	--	--	--	28	19	23.5	104.4
Gus	3	22	29	26	--	--	25.7	101.3
Newana	5	22	29	25	25	20	24.2	100.0
Hi-Line	5	24	28	25	27	17	24.2	100.0
MT 9354	1	--	--	--	--	20	20.0	100.0
Trenton	1	--	--	--	--	20	20.0	100.0
Rambo	5	22	30	25	26	16	23.8	98.3
Westbred 926	5	24	27	25	25	18	23.8	98.3
Pioneer 2375	1	--	--	--	--	19	19.0	95.0
MT 9360	1	--	--	--	--	19	19.0	95.0
MTHW9406	1	--	--	--	--	19	19.0	95.0
Border	2	--	--	--	25	17	21.0	93.3
Westbred 936	1	--	--	--	--	18	18.0	90.0
Fergus	1	--	--	--	--	18	18.0	90.0
Vanna	1	--	--	--	--	18	18.0	90.0
Express	1	--	--	--	--	15	15.0	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, Newana.

Table 5. Relative protein contents of spring wheat varieties as compared to Newana when grown under dryland continuous cropping conditions at the Eastern Agricultural Research Center, Sidney, Montana, during the 1991-1995 period.

Cultivar	# of years	1991	1992	1993	1994	1995	Ave	as % of Newana
Kulm	2	--	--	--	15.6	17.4	16.5	115.8
Lancer	4	18.2	16.8	17.8	14.6	--	16.8	112.0
Westbred 936	1	--	--	--	--	17.5	17.5	111.5
Cutless	4	17.9	16.5	17.8	14.6	--	16.7	111.0
Ernest	2	--	--	--	14.7	16.9	15.8	110.9
Express	1	--	--	--	--	17.4	17.4	110.8
Gus	3	17.8	16.5	18.1	--	--	17.5	110.5
MT 9360	1	--	--	--	--	17.3	17.3	110.2
Fortuna	5	17.4	17.3	16.5	13.7	17.4	16.5	108.4
Fergus	1	--	--	--	--	17.0	17.0	108.3
Hi-Line	5	18.1	15.9	16.7	14.2	16.9	16.4	107.8
Stoa	5	17.5	16.0	17.3	14.5	16.1	16.3	107.2
Border	2	--	--	--	14.5	16.0	15.2	107.0
Grandin	5	17.0	16.2	16.9	14.8	16.2	16.2	106.9
McNeal	4	--	15.2	16.7	13.6	16.7	15.6	106.9
Olaf	3	17.7	15.9	16.9	--	--	16.8	106.5
Len	5	17.4	15.6	17.1	13.8	16.4	16.1	105.8
Amidon	5	17.3	15.4	16.6	14.2	16.4	16.0	105.6
Westbred 926	5	17.7	15.2	16.6	13.7	16.6	16.0	105.1
Lew	5	17.5	15.4	17.2	14.1	15.6	16.0	105.1
Pondera	5	18.2	14.7	16.8	13.6	16.3	15.9	104.9
Pioneer 2375	1	--	--	--	--	16.4	16.4	104.5
Trenton	1	--	--	--	--	16.4	16.4	104.5
Rambo	5	17.5	14.5	16.1	13.1	15.7	15.4	101.3
Newana	5	17.7	14.0	15.7	12.8	15.7	15.2	100.0
MT 9354	1	--	--	--	--	15.7	15.7	100.0
Glenman	5	17.3	13.7	16.3	13.1	14.8	15.0	99.1
MTHW9406	1	--	--	--	--	15.2	15.2	96.8
Vanna	1	--	--	--	--	13.4	13.4	85.4

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

Table 6. Agronomic data obtained from a dryland recrop durum yield trial conducted at the Eastern Agricultural Research Center, Sidney, MT, 1995.
Planting date: 28 April 1995 Harvest date: 16 August 1995

Variety	Days to heading [1]	Height, inches	Protein content	Test wt, lb/bu	Yield bu/acre
Crosby	60	22	14.7	61.2	37.4
Sceptre	59	24	16.7	60.7	36.1
Vic	60	28	16.6	61.2	35.8
Renville	60	28	17.1	61.3	35.4
Monroe	56	26	16.2	60.3	34.3
Voss	59	24	15.8	62.3	33.4
Lloyd	59	22	15.3	62.0	33.2
Munich	59	25	16.5	61.2	32.3
Laker	60	26	15.2	61.7	31.5
Plenty	58	27	17.1	61.2	30.2
Medora	59	28	16.9	61.5	29.7
Ward	59	27	17.2	60.5	28.9
Kyle	61	31	19.5	61.0	28.6
mean	59.3	26.0	16.5	61.2	32.8
LSD 0.05	0.67	3.78	0.95	0.40	NS[2]

[1] Heading date is number of days from planting

Check variety is Ward with an average yield of 28.9 bu/a.

[2] No significant differences in yield were detected among varieties.

Table 7. Relative yielding abilities of durum varieties as compared to Ward when grown under dryland continuous cropping conditions at the Eastern Agricultural Research Center, Sidney, Montana, during the 1991-1995 period.

Cultivar	# of years	1991	1992	1993	1994	1995	Ave	as % of Ward
Voss	1	--	--	--	--	33.4	33.4	115.6
Plenty	3	--	--	27.7	36.0	30.2	31.3	112.9
Renville	5	12.7	92.0	22.1	31.0	35.4	38.6	112.1
Sceptre	5	13.3	86.8	27.4	29.2	36.1	38.6	111.8
Munich	1	--	--	--	--	32.3	32.3	111.8
Lloyd	5	11.5	97.2	20.7	23.1	33.2	37.1	107.7
Crosby	5	13.3	80.9	23.3	30.4	37.4	37.1	107.5
Kyle	2	--	--	--	35.1	28.6	31.8	105.8
Laker	5	8.9	93.4	19.0	28.2	31.5	36.2	105.0
Cando	4	8.9	83.3	25.5	32.6	--	37.6	104.7
Vic	5	10.3	79.7	21.9	31.9	35.8	35.9	104.2
Medora	5	13.8	80.1	20.2	32.6	29.7	35.3	102.3
Monroe	5	12.7	73.0	24.4	28.9	34.3	34.7	100.5
Ward	5	12.6	76.6	23.0	31.3	28.9	34.5	100.0

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 8. Relative test weights of durum varieties as compared to Ward when grown under dryland continuous cropping conditions at the Eastern Agricultural Research Center, Sidney, Montana, during the 1991-1995 period.

Cultivar	# of years	1991	1992	1993	1994	1995	Ave	as % of Ward
Voss	1	--	--	--	--	62.3	62.3	103.0
Cando	4	58.6	64.5	55.7	60.3	--	59.8	101.6
Munich	1	--	--	--	--	61.2	61.2	101.2
Medora	5	57.8	63.3	54.1	60.3	61.5	59.4	100.4
Renville	5	59.3	62.5	55.4	57.8	61.3	59.3	100.2
Vic	5	58.9	62.8	53.8	59.5	61.2	59.2	100.1
Ward	5	57.9	63.0	54.3	60.2	60.5	59.2	100.0
Monroe	5	57.8	62.8	55.3	58.8	60.3	59.0	99.7
Laker	5	59.8	62.8	52.9	57.5	61.7	58.9	99.6
Plenty	3	--	--	54.5	58.3	61.2	58.0	99.4
Crosby	5	57.8	63.2	54.2	57.3	61.2	58.7	99.3
Sceptre	5	57.9	63.2	54.7	56.7	60.7	58.6	99.1
Kyle	2	--	--	--	58.5	61.0	59.8	99.0
Lloyd	5	55.9	62.3	53.7	54.3	62.0	57.6	97.4

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

Table 9. Relative heights of durum varieties as compared to Ward when grown under dryland continuous cropping conditions at the Eastern Agricultural Research Center, Sidney, Montana, during the 1991-1995 period.

Cultivar	# of years	1991	1992	1993	1994	1995	Ave	as % of Ward
Kyle	2	--	--	--	35	31	33.0	117.9
Plenty	3	--	--	29	32	27	29.3	103.5
Medora	5	22	33	30	31	28	28.8	102.1
Vic	5	23	33	29	30	28	28.6	101.4
Renville	5	24	32	29	30	28	28.6	101.4
Ward	5	24	32	29	29	27	28.2	100.0
Monroe	5	23	31	29	27	26	27.2	96.5
Crosby	5	22	33	28	30	22	27.0	95.7
Laker	5	22	29	27	29	26	26.6	94.3
Munich	1	--	--	--	--	25	25.0	92.6
Sceptre	5	21	29	27	29	24	26.0	92.2
Voss	1	--	--	--	--	24	24.0	88.9
Lloyd	5	21	26	25	25	22	23.8	84.4
Cando	4	21	25	24	26	--	24.0	84.2

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, Ward.

Table 10. Relative protein contents of durum varieties as compared to Ward when grown under dryland continuous cropping conditions at the Eastern Agricultural Research Center, Sidney, Montana, during the 1991-1995 period.

Cultivar	# of years	1991	1992	1993	1994	1995	Ave	as % of Ward
Kyle	2	--	--	--	15.5	19.5	17.5	106.1
Renville	5	21.2	16.2	16.0	14.9	17.1	17.1	101.3
Medora	5	20.1	16.4	16.1	15.0	16.8	16.9	100.1
Ward	5	19.8	15.5	16.0	15.8	17.2	16.9	100.0
Monroe	5	19.2	16.3	16.6	14.8	16.2	16.6	98.6
Vic	5	19.7	15.5	15.5	15.8	16.6	16.6	98.6
Crosby	5	19.9	16.3	16.6	15.4	14.7	16.6	98.3
Sceptre	5	20.1	15.3	16.0	14.7	16.7	16.6	98.2
Plenty	3	--	--	15.4	15.5	17.1	16.0	98.0
Cando	4	20.6	14.8	15.2	15.1	--	16.4	97.9
Munich	1	--	--	--	--	16.5	16.5	95.9
Laker	5	19.6	15.0	15.5	13.8	15.2	15.8	93.8
Lloyd	5	20.4	13.2	14.6	15.0	15.3	15.7	93.1
Voss	1	--	--	--	--	15.8	15.8	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 protein contents only to the check variety, Ward.

Table 11. Agronomic data obtained from a dryland recrop barley yield trial conducted at the Eastern Agricultural Research Center, Sidney, MT, 1995.
Planting date: 28 April 1995 Harvest date: 4 August 1995

Variety	Days to heading [1]	Height, inches	Protein content	Test wt, lb/bu	Yield bu/acre
Targhee	60	19	13.3	49.7	67.2
MT890008	61	17	12.7	48.2	65.6
MT890070	59	18	12.5	49.7	65.3
H1851195	60	19	13.1	49.0	64.3
Gallatin	58	22	12.7	50.3	62.9
MT889106	59	19	12.6	50.0	61.0
Stark	57	20	12.4	50.2	61.0
MT886610	60	19	13.4	49.8	60.5
Lewis	61	17	12.8	50.2	60.0
H3860224	60	18	14.1	49.5	57.9
Bowman	58	19	12.6	50.5	57.9
Hector	60	20	13.0	50.0	57.7
Chinook	61	19	12.9	50.0	57.5
Piroline	59	20	14.1	51.7	57.5
Harrington	59	19	13.1	49.2	57.2 x
Steptoe	56	17	12.4	46.7	56.0 x
Baronesse	61	17	13.6	49.3	55.0 xx
Colter	57	16	10.7	46.7	54.7 xx
mean	59.2	18.6	12.9	49.5	59.9
LSD 0.05	1.32	2.27	0.83	1.17	5.39
LSD 0.01					7.25

[1] Heading date is number of days from planting

Check variety is Gallatin with an average yield of 62.9 bu/a.
x indicates significantly less than check variety, Gallatin, at a probability of <0.05
xx indicates significantly less than check variety, Gallatin, at a probability of <0.01

Table 12. Relative yielding abilities of barley varieties as compared to Gallatin when grown under dryland continuous cropping conditions at the Eastern Agricultural Research Center, Sidney, Montana, during the 1991-1995 period.

Cultivar	# of years	1991	1992	1993	1994	1995	Ave	as % of Gallatin
Targhee	1	--	--	--	--	67.2	67.2	106.8
Lewis	5	30.5	93.3	41.1	40.7	59.9	53.1	105.6
Baronesse	5	27.6	87.3	52.6	39.0	55.0	52.3	104.0
Hector	5	28.6	89.1	40.0	41.5	57.7	51.4	102.2
Gallatin	5	25.7	86.0	39.9	36.9	62.9	50.3	100.0
Chinook	5	25.8	86.2	39.8	35.3	57.5	48.9	97.3
Piroline	5	25.2	82.3	42.4	36.7	57.5	48.8	97.1
Stark	5	20.2	95.3	23.7	42.0	61.0	48.4	96.3
Steptoe	5	27.3	82.5	36.0	36.9	56.0	47.7	94.9
Harrington	5	20.3	84.5	42.9	31.7	57.2	47.3	94.1
Bowman	5	26.6	81.2	21.7	38.8	57.9	45.2	90.0
Colter	3	--	--	31.9	28.9	54.7	38.5	82.7

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 Gallatin.

Table 13. Relative test weights of barley varieties as compared to Gallatin when grown under dryland continuous cropping conditions at the Eastern Agricultural Research Center, Sidney, Montana, during the 1991-1995 period.

Cultivar	# of years	1991	1992	1993	1994	1995	Ave	as % of Gallatin
Stark	5	50.9	53.2	47.0	50.2	50.2	50.3	101.2
Lewis	5	50.4	53.5	47.7	48.3	50.2	50.0	100.7
Piroline	5	48.1	53.7	47.5	49.0	51.7	50.0	100.6
Hector	5	51.3	53.0	46.3	48.2	50.0	49.8	100.2
Chinook	5	50.4	53.8	46.3	48.1	50.0	49.7	100.1
Gallatin	5	50.1	53.3	46.7	48.0	50.3	49.7	100.0
Bowman	5	50.2	52.8	45.7	49.3	50.5	49.7	100.0
Baronesse	5	47.5	53.5	47.0	48.0	49.3	49.1	98.8
Targhee	1	--	--	--	--	49.7	49.7	98.8
Harrington	5	46.0	52.5	45.7	47.0	49.2	48.1	96.8
Steptoe	5	47.1	48.2	42.8	41.5	46.7	45.3	91.1
Colter	3	--	--	40.7	42.2	46.7	43.2	89.4

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

Table 14. Relative heights of barley varieties as compared to Gallatin when grown under dryland continuous cropping conditions at the Eastern Agricultural Research Center, Sidney, Montana, during the 1991-1995 period.

Cultivar	# of years	1991	1992	1993	1994	1995	Ave	as % of Gallatin
Hector	5	24	28	26	23	20	24.2	101.7
Piroline	5	22	28	28	22	20	24.0	100.8
Gallatin	5	21	28	26	22	22	23.8	100.0
Stark	5	23	27	25	23	20	23.6	99.2
Chinook	5	20	28	24	22	19	22.6	95.0
Bowman	5	20	28	24	22	19	22.6	95.0
Harrington	5	22	26	24	21	19	22.4	94.1
Lewis	5	22	26	24	22	17	22.2	93.3
Steptoe	5	19	26	25	21	17	21.6	90.8
Colter	3	--	--	25	21	16	20.7	88.6
Baronesse	5	19	24	23	20	17	20.6	86.6
Targhee	1	--	--	--	--	18	18.0	81.8

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 Gallatin.

Table 15. Relative protein contents of barley varieties as compared to Gallatin when grown under dryland continuous cropping conditions at the Eastern Agricultural Research Center, Sidney, Montana, during the 1991-1995 period.

Cultivar	# of years	1991	1992	1993	1994	1995	Ave	as % of Gallatin
Piroline	5	15.8	13.3	14.8	13.3	14.0	14.2	107.4
Targhee	1	--	--	--	--	13.3	13.3	104.7
Baronesse	5	15.5	12.7	13.1	13.3	13.6	13.6	102.9
Chinook	5	15.2	12.5	14.0	12.6	12.9	13.4	101.4
Harrington	5	15.2	12.4	13.5	12.5	13.0	13.3	100.5
Hector	5	14.8	12.4	13.6	12.6	13.0	13.3	100.2
Gallatin	5	15.1	12.5	13.8	12.2	12.7	13.3	100.0
Lewis	5	14.6	12.3	13.6	12.5	12.8	13.2	99.2
Bowman	5	14.2	13.0	13.8	12.0	12.6	13.1	98.9
Stark	5	14.4	12.6	13.4	11.0	12.4	12.8	96.2
Steptoe	5	13.3	12.4	12.9	11.4	12.4	12.5	94.1
Colter	3	--	--	12.3	11.2	10.7	11.4	88.4

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

Table 16. Agronomic data obtained from a dryland recrop oat yield trial conducted at the Eastern Agricultural Research Center, Sidney, MT, 1995.
Planting date: 28 April 1995 Harvest date: 4 August 1995

Variety	Days to heading [1]	Height, inches	Protein content	Test wt, lb/bu	Yield bu/acre
Border	62	24	12.3	36.7	93.5
Monida	61	26	12.6	38.5	91.6
Whitestone	61	24	12.3	37.0	91.3
Cayuse	58	24	12.2	37.2	88.6
90AB1322	57	20	12.8	39.5	88.4
Appaloosa	61	24	12.0	36.0	87.0
Otana	60	30	12.9	38.8	86.7
Newdak	56	26	12.6	37.8	86.2
83AB3250	62	22	12.0	37.0	82.1
Rio Grande	57	23	13.0	38.3	80.6
Ajay	58	18	13.8	38.3	80.1
Valley	60	25	12.9	39.5	80.0
Park	59	27	13.4	37.2	78.9
Ogle	55	26	13.0	37.3	78.7
Rodney	59	29	12.9	37.7	77.7 x
Robert	61	25	13.3	35.7	70.8 xx
88AB3073	61	23	16.6	48.2	56.3 xx
86AB1616	62	24	15.8	42.5	48.7 xx
Paul	60	28	17.7	45.3	48.0 xx
mean	59.5	24.6	13.4	38.9	78.7
LSD 0.05	1.10	1.56	0.73	1.47	8.94
LSD 0.01					11.99

[1] Heading date is number of days from planting

Check variety is Otana with an average yield of 86.7 bu/a.
x indicates significantly less than check variety, Otana, at a probability of <0.05
xx indicates significantly less than check variety, Otana, at a probability of <0.01

Table 17. Relative yielding abilities of oat varieties as compared to Otana when grown under dryland continuous cropping conditions at the Eastern Agricultural Research Center, Sidney, Montana, during the 1991-1995 period.

Cultivar	# of years	1991	1992	1993	1994	1995	Ave	as % of Otana
Troy	2	--	--	109.0	69.2	--	89.1	111.9
Monida	5	32.1	159.8	126.0	64.4	91.6	94.8	110.6
Cayuse	5	38.5	142.6	139.8	61.6	88.6	94.2	109.9
Appaloosa	5	31.3	155.6	128.6	60.2	87.0	92.5	108.0
Border	5	32.7	151.0	121.8	63.3	93.5	92.5	107.9
Rio Grande	4	--	140.8	124.8	78.1	80.6	106.1	106.8
Settler	2	--	--	98.2	71.2	--	84.7	106.4
Whitestone	2	--	--	--	66.1	91.3	78.7	105.2
Newdak	4	--	151.0	99.0	71.5	86.2	101.9	102.6
Derby	3	--	159.0	93.8	60.6	--	104.5	100.9
Otana	5	31.3	151.4	96.3	62.9	86.7	85.7	100.0
Ogle	5	27.3	140.9	109.2	72.1	78.7	85.6	99.9
Ajay	4	--	131.6	119.9	62.6	80.1	98.6	99.2
Calibre	4	30.0	165.7	88.6	55.0	--	84.8	99.2
Riel	4	30.4	139.7	104.3	60.9	--	83.8	98.1
Robert	5	29.1	146.3	98.6	69.1	70.8	82.8	96.6
Park	5	26.6	132.9	95.0	66.3	78.9	79.9	93.3
Valley	5	29.9	122.5	110.0	57.2	80.0	79.9	93.2
Rodney	2	--	--	--	57.2	77.6	67.4	90.1
Paul	2	--	--	--	49.5	48.0	48.8	65.2

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 18. Relative test weights of oat varieties as compared to Otana when grown under dryland continuous cropping conditions at the Eastern Agricultural Research Center, Sidney, Montana, during the 1991-1995 period.

Cultivar	# of years	1991	1992	1993	1994	1995	Ave	as % of Otana
Paul	2	--	--	--	45.5	45.3	45.4	113.4
Settler	2	--	--	37.7	42.5	--	40.1	103.5
Otana	5	36.4	37.2	36.2	41.3	38.8	38.0	100.0
Riel	4	35.7	38.0	35.3	41.4	--	37.6	99.5
Valley	5	34.4	38.0	35.3	41.5	39.5	37.7	99.4
Troy	2	--	--	36.0	40.9	--	38.4	99.2
Whitestone	2	--	--	--	40.2	37.0	38.6	96.4
Rodney	2	--	--	--	39.4	37.7	38.6	96.3
Newdak	4	--	35.3	34.3	39.1	37.8	36.6	95.4
Derby	3	--	34.5	35.2	39.5	--	36.4	95.2
Robert	5	34.4	35.3	35.3	38.6	35.7	35.9	94.4
Ogle	5	34.0	33.3	33.5	39.7	37.3	35.6	93.6
Rio Grande	4	--	34.2	35.3	35.8	38.3	35.9	93.6
Calibre	4	31.7	35.2	33.2	38.4	--	34.6	91.7
Monida	5	30.1	34.5	35.0	35.7	38.5	34.8	91.5
Ajay	4	--	32.3	33.3	36.3	38.3	35.0	91.3
Cayuse	5	29.8	34.5	34.0	36.0	37.2	34.3	90.3
Park	5	30.4	33.8	31.7	38.0	37.2	34.2	90.1
Border	5	30.9	32.2	32.7	35.7	36.7	33.6	88.6
Appaloosa	5	30.2	33.2	31.8	34.9	36.0	33.2	87.5

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 Otana

Table 19. Relative heights of oat varieties as compared to Otana when grown under dryland continuous cropping conditions at the Eastern Agricultural Research Center, Sidney, Montana, during the 1991-1995 period.

Cultivar	# of years	1991	1992	1993	1994	1995	Ave	as % of Otana
Otana	5	25	38	37	34	30	32.8	100.0
Calibre	4	26	38	37	32	--	33.2	99.3
Derby	3	--	36	38	34	--	36.0	99.1
Rodney	2	--	--	--	33	29	31.0	96.9
Park	5	26	37	36	32	27	31.6	96.3
Riel	4	26	36	34	31	--	31.8	94.8
Troy	2	--	--	36	31	--	33.5	94.4
Paul	2	--	--	--	32	28	30.0	93.8
Monida	5	24	36	35	31	26	30.4	92.7
Robert	5	27	35	34	29	25	30.0	91.5
Cayuse	5	26	33	33	27	24	28.6	87.2
Newdak	4	--	32	34	28	26	30.0	86.3
Border	5	22	33	33	28	24	28.0	85.4
Valley	5	24	31	31	29	25	28.0	85.4
Whitestone	2	--	--	--	30	24	27.0	84.4
Ogle	5	23	30	31	28	26	27.6	84.1
Appaloosa	5	23	32	32	27	24	27.6	84.1
Settler	2	--	--	30	28	--	29.0	81.7
Rio Grande	4	--	28	30	26	23	26.8	77.0
Ajay	4	--	24	26	23	18	22.8	65.5

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 Otana.

Table 20. Relative protein contents of oat varieties as compared to Otana when grown under dryland continuous cropping conditions at the Eastern Agricultural Research Center, Sidney, Montana, during the 1991-1995 period.

Cultivar	# of years	1991	1992	1993	1994	1995	Ave	as % of Otana
Paul	2	--	--	--	15.4	17.6	16.5	128.4
Settler	2	--	--	14.5	13.8	--	14.2	108.4
Ajay	4	--	12.9	13.6	13.4	13.8	13.4	105.1
Park	5	15.3	13.0	13.6	13.7	13.4	13.8	105.0
Rodney	2	--	--	--	13.9	12.9	13.4	104.3
Troy	2	--	--	13.3	13.9	--	13.6	104.2
Riel	4	14.6	12.4	14.2	13.6	--	13.7	103.6
Valley	5	14.6	12.7	13.9	13.5	12.9	13.5	102.9
Robert	5	14.7	13.0	12.9	12.6	13.3	13.3	101.2
Rio Grande	4	--	13.0	12.8	12.9	13.0	12.9	101.2
Newdak	4	--	12.4	13.7	13.0	12.6	12.9	101.2
Calibre	4	14.3	12.6	13.3	13.0	--	13.3	100.6
Otana	5	14.6	12.2	13.2	12.9	12.8	13.1	100.0
Border	5	14.5	12.7	12.9	13.2	12.3	13.1	99.8
Ogle	5	14.1	12.2	13.0	12.8	13.0	13.0	99.1
Appaloosa	5	14.4	12.1	12.3	13.3	12.0	12.8	97.6
Derby	3	--	12.3	12.7	12.3	--	12.4	97.4
Monida	5	14.3	11.9	12.2	12.6	12.6	12.7	96.8
Cayuse	5	14.1	11.8	12.4	12.5	12.2	12.6	95.9
Whitestone	2	--	--	--	12.2	12.3	12.2	95.3

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