

**PROJECT TITLE:** Evaluation of winter and spring cereals under a no-till, re-crop environment at Moccasin.

**PROJECT LEADER:** D.M. Wichman, Agronomist, Moccasin, MT

**PROJECT PERSONNEL:** P.L. Bruckner, Winter Wheat Breeder, Bozeman, MT  
 L.E. Talbert, Spring Wheat Breeder, Bozeman, MT  
 T.K. Blake, Barley Breeder, Bozeman, MT  
 J.E. Berg, Winter Wheat Research Associate, Bozeman, MT  
 S.P. Lanning, Spring Wheat Research Associate, Bozeman, MT  
 P.F. Hensleigh, Barley Research Associate, Bozeman, MT  
 R.L. Murphy, Agricultural Research Specialist, Moccasin, MT  
 J. Vavrovsky, Research Technician, Moccasin, MT

**OBJECTIVES:**

To evaluate the agronomic performance of winter wheat, spring wheat, durum, barley and oat varieties under no-till, re-crop conditions at Moccasin.

**RESULTS:**

The 1998 variety trials were planted no-till into barley stubble. The winter wheat was planted on reduced tillage land that has been continuously cropped since 1990. Seeding conditions were very dry, and crop year moisture was below normal until June. Normal rainfall throughout the rest of the growing season resulted in typical winter wheat yields. The spring crops were planted in late April, also on barley stubble. Droughty conditions were prevalent after seeding, which resulted in uneven germination. Lack of moisture after seeding, coupled with hot, dry conditions during grain fill may have contributed to lower yields and test weights of the spring crops.

**Winter Wheat:** Yields ranged from 36 to 53 bu/a with the average yield equal to 47 bu/a. Experimental line MT9524 and Judith were the high yielders, but Judith had the lowest test weight at 59 lbs/bu, while MT9524 had the highest test weight at 63 lbs/bu. All varieties were at or above their long term averages for this location. The current year's data and the multi-year summary data are presented in Tables 1 and 2.

**Spring Wheat:** Yields ranged from 30 to 39 bu/a with the average yield equal to 35 bu/a. Glenman, experimental line MTHW9420 and McNeal were the top yielders although there were no significant differences among the yields. Although cool temperatures and above average rainfall was received during June and the first days of July (during heading) hot, dry windy conditions were experienced during grain-fill, resulting in lower than average yields and test weights. The current year's data and multi-year yield summary data are presented in Tables 3 and 4.

**Barley:** Yields ranged from 36 to 47 bu/a with the average yield equal to 42 bu/a. Experimental lines MTLB 5, MTLB 57 and MTLB 6 (Lewis/Baronesse crosses) were the top three yielders. Test weights were below normal, probably due to environmental conditions mentioned above. Baronesse has the highest long term yield (7 years of evaluation) of 56 bu/a, two bu/a higher than Hector. The current year's data and multi-year summary data are presented in Tables 5 and 6.

**Durum:** This was the third year evaluating durum varieties under no-till conditions. Yields ranged from 27 to 35 bu/a with the average yield equal to 31 bu/a. Vic was the highest yielding variety and also had good test weight (60 lbs/bu). Vic is also one of the highest yielders for the 3-year long-term averages. The current year's data and multi-year summary data are presented in Tables 7 and 8.

**Oats:** Yields ranged from 1983 to 2827 lbs/a with the average yield equal to 2361 lbs/a. Monida was the highest yielding line in this year's trial as well as in the long-term 7-year average. Test weights averaged 37 lbs/bu. The current year's data and multi-year summary data are presented in Tables 9 - 11.

**SUMMARY:** Crop year moisture was below normal through May, but six inches of rain at the end of June to beginning of July brought the year's accumulation back to normal. April and May temperatures were warmer than normal, while June was cool and wet. The winter wheat trial experienced dry conditions during seeding but benefited from the cool wet weather during June and yields were slightly above normal. Volunteer barley caused some interference with the winter wheat trial. The spring crops were hurt by the lack of moisture experienced after seeding and the hot, dry conditions during heading and grain-fill in July. Spring crop yields and test weights were generally below normal.

**FUTURE PLANS:** No-till, re-crop variety trials will continue to be evaluated at the Central Agricultural Research Center.

Table 1. 1998 CARC No-Till Winter Wheat Variety Performance Trial - Exp. 3870.  
Central Agricultural Research Center, Moccasin, MT.

Variety	Grain Yield (bu/a)	Test Weight (lbs/bu)	Heading Date (Julian <sup>1/</sup> )	Plant Height (in.)	Protein Content (%)
MT 9524	53.3	62.9	166	34	11.3
Judith	53.1	59.4	164	32	10.6
Quantum 542	51.8	61.2	164	34	11.3
Manning	51.6	61.3	167	30	11.6
Rocky	50.2	61.1	164	31	11.0
MT 9514	50.1	60.8	169	33	10.9
Promontory	49.9	62.6	166	30	11.4
MTW 9441	49.8	61.1	170	33	11.3
NuWest	49.5	60.8	169	32	11.4
Kestrel	49.0	59.7	167	33	9.4
Rampart	48.2	61.1	167	33	13.2
Bighorn	48.1	61.4	168	28	12.5
Vanguard	47.4	61.1	165	33	12.3
MT 9432	46.8	62.7	167	32	11.6
Neeley	46.7	60.3	167	34	12.0
Tiber	46.4	62.2	169	34	12.1
Norstar	44.9	62.5	172	41	9.9
Pronghorn	43.5	60.1	161	26	12.5
Erhardt	43.5	62.0	167	29	12.3
Elkhorn	43.3	60.6	168	36	12.5
Redwin	42.5	61.7	167	34	12.3
Halt	42.3	59.7	161	26	12.7
Alliance	41.9	60.6	160	28	12.6
McGuire	36.2	61.1	163	30	13.5
Experimental Means	47.1	61.2	166.2	31.9	11.8
F-Value for Var. (df=23)	3.3**	13.5**	17.6**	14.3**	-
CV 1: (s/mean)*100	8.5	0.4	0.8	4.7	-
LSD (0.05)	6.6	0.8	2.1	2.5	-

<sup>1/</sup> Number of days from Jan. 1 (160 = June 9)

\*\* Denotes Statistical Significance at P ≤ 0.01.

Planted: 9/22/1997

Harvested: 8/15/1998

Previous Crop: Barley

Fertilizer: 18-46-0 w/ seed, 60# N topdress (early April) and 20# N post-jointing (May 18)

Growing Season Precipitation (April – July): 9.35" – 90 year avg.: 8.69"

April	May	June	July
0.59"	1.89"	4.79"	2.08"

Table 2. CARC No-Till Winter Wheat Multi-Year Yield Summary of Selected Varieties, 1993-1998. Central Agricultural Research Center. Moccasin, MT.

Selected Varieties	1993	1995	1996	1997	1998	Avg.	Neeley Same Yrs
Centurk	38	34	33	65		43	44
Norstar	39	33 <sup>1/</sup>	26	54	45	39	45
Neeley	44	33	31	69	47	45	-
Rocky	40	39	34	73	50	47	45
Tiber	45	36	29	56	46	42	45
Judith	36	40	31	63	53	45	45
Quantum 542	38	30	30	66	52	43	45
Bighorn	35	40	28	65	48	43	45
Hawk	32	36	25	59		38	44
Agassiz	32	37	28	55		38	44
NuWest		38	30	51 <sup>2/</sup>	50	42	45
Kestrel	40	44	29	51 <sup>2/</sup>	49	43	45
Erhardt		35	28	63	44	43	45
Vanguard		27 <sup>1/</sup>	27	59	47	40	45
Rampart		36	27	55 <sup>2/</sup>	48	42	45
McGuire		31	28	53	36	37	45
Yuma			29	60		45	50
Promontory			29	61	50	47	49
MT 9432				65	47	56	58
<b>Nursery Mean</b>	<b>37.1</b>	<b>35.6</b>	<b>29.3</b>	<b>60.9</b>	<b>47.1</b>		
<b>Crop Yr. Precip. (in.)</b> <b>(Sept. - Aug.)</b>	<b>20.5</b>	<b>20.7</b>	<b>11.2</b>	<b>18.8</b>	<b>13.8</b>		
April (in.)	1.2	2.3	1.0	1.4	0.6		
May (in.)	0.9	3.8	3.1	2.0	1.9		
June (in.)	4.2	3.7	1.3	4.1	4.8		
July (in.)	5.7	3.6	0.3	3.7	2.1		

All trials were seeded no-till on barley stubble.

The 1994 trial was abandoned due to variable germination, which resulted from extremely wet conditions experienced during seeding.

1/ Suspected low germination resulted in low yields.

2/ Yields from one rep only.

Table 3. 1998 Moccasin Re-crop Spring Wheat Variety Trial – Exp. 9970. Central Agricultural Research Center. Moccasin, MT.

Id	Variety/Line	Grain Yield (bu/a)	Test Weight (lbs/bu)	Heading Date (Julian <sup>1/</sup> )	Plant Height (in.)	Protein Content (%)
PI483235	GLENMAN	38.7	59.4	189	30	13.7
MTHW9420	MT8182/MT8289	37.7	58.7	184	31	14.3
PI574642	MCNEAL	36.5	58.4	188	31	15.4
WB 926	WESTBRED 926	36.3	57.9	182	29	15.5
CI 17790	LEN	35.9	59.6	188	29	14.8
PNR 2375	PIONEER 2375	35.5	60.5	183	32	14.5
CI 17429	LEW	35.3	60.9	187	36	14.4
ND 626	GRANDIN	35.2	58.6	188	32	15.7
CI 17430	NEWANA	35.2	59.3	189	29	14.5
PI549275	HI-LINE	34.7	59.5	184	29	14.5
ND 677	ERNEST	34.4	60.1	186	36	14.8
ND 606	AMIDON	34.3	57.7	187	37	14.2
ND 582	STOA	33.9	57.6	186	36	14.9
WB 936	WESTBRED 936	33.8	58.0	182	27	15.6
WBExpress	WESTBRED EXPRESS	33.7	58.5	187	28	14.7
TR983239	FERGUS	33.6	59.0	182	29	15.3
CI 13596	FORTUNA	32.6	60.1	186	35	15.1
C982-324	RAMBO	32.5	58.0	187	30	14.6
MT 9433	MT8808/MARBERG	32.5	59.6	187	35	15.1
ND 673	TRENTON	32.1	59.9	185	36	15.0
MT 9609	FORTUNA/AMIDON	29.9	60.0	185	34	14.6
Experimental Means		34.5	59.1	186	32	14.8
F Test for Var. (df=20)		0.7ns	7.0**	12.7**	10.9**	-
C.V. 1: (S/Mean) *100		11.8	1.1	0.6	5.3	-
LSD (0.05)		6.7	1.0	1.7	2.8	-

\* Note: This year's nursery experienced uneven germination and hot, dry conditions during heading, all which may have contributed to lower yields and test weights.

<sup>1/</sup> Number of days from Jan. 1 (180 = June 29).

\*\* Denotes Statistical Significance at P<= 0.01

ns Denotes NO Statistical Significance at P<= 0.05

Planted: 4/27/1998 no-till into 'Lewis' barley stubble.

Harvested: 8/19/1998

Fertilizer: 90# N post-plant broadcast, 35# N broadcast pre-heading (7/3/98)

Growing Season Precipitation (April – July): 9.35" – 90 year avg.: 8.69"

<u>April</u>	<u>May</u>	<u>June</u>	<u>July</u>
0.59"	1.89"	4.79"	2.08"

Table 4. Moccasin Re-Crop Spring Wheat Multi-Year Yield Summary of Selected Varieties, 1989 – 1998. Central Agricultural Research Center. Moccasin, MT.

Selected Varieties	1989	1990	1992	1993	1994	1995	1996	1997	1998	Avg.	Newana Same Yrs.
Amidon	39	20	35	55	23	40	22	52	34	35.6	35.9
Len	34	19	27	47	23	45	21	48	36	33.3	35.9
Stoa	40	20	31	46	21	36	21	49	34	33.1	35.9
Glenman	43	21	36	47	24	39	23	57	39	36.5	35.9
Westbred 926		20	29	51	23	42	23	58	36	35.3	35.2
Grandin		22	30	54	20	40	20	52	35	34.2	35.2
Fortuna	35	15	27	44	24	35	22	48	33	31.4	35.9
Rambo	39	21	34	43	23	39	21	55	33	34.2	35.9
Lew	36	18	34	46	20	36	19	52	35	32.9	35.9
Newana	42	19	35	48	25	47	23	49	35	35.9	-
Hi-Line	39	19	29	49	21	39	22	57	35	34.4	35.9
McNeal			39	52	22	45	24	63	37	40.2	37.5
Ernest					21	40	20	48	34	32.7	35.8
Fergus						41	20	56	34	37.7	38.6
WB Express						39	23	57	34	38.2	38.6
Vanna						44	22	73		46.3	39.7
Westbred 936						43	23	53	34	38.2	38.6
Pioneer 2375						40	23	56	36	38.6	38.6
MT 9433							24	51	33	35.8	35.7
MTHW 9420							23	66	38	42.2	35.7
Nursery Mean	39.6	20.4 <sup>1/</sup>	31.1	48.1	22.4	40.4	21.9	54.8	34.5		
Growing Season Precip. (in.)	10.4	6.4	9.1	12.1	8.0	13.4	5.7	11.3	9.4		
April Precip. (in.)	2.6	1.2	1.0	1.2	2.1	2.3	1.0	1.4	0.6		
May Precip. (in.)	1.8	3.3	1.4	0.9	3.1	3.8	3.1	2.0	1.9		
June Precip. (in.)	2.4	0.9	3.5	4.2	1.7	3.7	1.3	4.1	4.8		
July Precip. (in.)	3.4	1.1	3.1	5.7	1.1	3.6	0.3	3.7	2.1		

1/ 1990 Variety trial on fallow, all other years re-crop no-till.

1991 Variety trial on no-till barley stubble experienced severe hail damage.

Table 5. 1998 Moccasin Re-crop Barley Variety Trial – Exp. 3670. Central Agricultural Research Center. Moccasin, MT.

Id	Variety/Line	Grain Yield (bu/a)	Test Weight (lbs/bu)	Heading Date (Julian <sup>1/</sup> )	Plant Height (in.)	Protein Content %	Plump <sup>2/</sup> %	Thin <sup>3/</sup> %	Stand %
MTLB 5	MTLB 5	46.5	48.3	191	30	13.3	43.4	21.5	76.7
MTLB 57	MTLB 57	46.5	47.1	192	28	12.4	32.9	29.9	78.3
MTLB 6	MTLB 6	44.1	48.4	189	29	12.7	66.6	10.3	80.0
PI568246	Baronesse	44.0	45.6	191	26	13.0	44.6	20.7	73.3
MT920073	MT920073	43.9	48.7	188	28	11.3	71.0	8.5	71.7
MTLB 32	MTLB 32	43.7	47.1	191	28	12.2	47.1	19.5	78.3
PI591823	Chinook	43.3	46.5	190	29	14.1	34.0	28.8	80.0
N1123111	Logan	42.6	47.6	185	30	13.2	62.0	13.9	80.0
CI 15514	Hector	42.5	47.4	189	29	11.4	47.4	21.6	76.7
ND 9866	Stark	42.0	51.1	185	31	12.6	79.2	6.0	83.3
MT910189	MT910189	40.5	47.6	191	28	11.8	57.4	14.2	76.7
PI483237	Bowman	38.9	49.3	185	30	12.6	77.4	7.3	80.0
PI491534	Gallatin	38.7	48.0	187	30	11.7	47.5	17.5	76.7
MT910150	MT910150	38.6	47.6	187	28	13.5	53.1	17.1	76.7
CI 15856	Lewis	37.0	48.0	191	28	13.0	59.8	13.2	75.0
SK 76333	Harrington	35.5	43.0	192	29	13.2	37.4	29.3	83.3
Experimental Means		41.8	47.6	188.9	28.9	12.6	53.8	17.5	77.9
F-Value for Var. (df = 15)		3.7**	7.3**	20.4**	1.8ns	-	9.5**	6.5**	0.43ns
CV 1: (S/Mean)*100		7.0	2.3	0.5	5.2	-	15.3	29.7	10.8
LSD (0.05)		4.9	1.9	1.6	2.5	-	13.7	8.6	14.1

\* Note: This year's nursery experienced uneven germination and hot, dry conditions during heading, all which may have contributed to lower yields and test weights.

1/ Number of days from Jan. 1 (180=June29)    2/ Plump > 6/64    3/ Thin < 5.5/64

\*\* Denotes Statistical Significance at P<= 0.01

ns Denotes NO Statistical Significance at P<= 0.05

Planted: 4/27/1998 no-till into 'Lewis' barley stubble.

Harvested: 8/12/1998

Fertilizer: 60# N post-plant broadcast, 35# N broadcast pre-heading (7/3/98)

Growing Season Precipitation (April – July): 9.35" – 90 year avg.: 8.69"

Table 6. Moccasin Re-Crop Barley Multi-Year Yield Summary of Selected Varieties, 1989-1998. Central Agricultural Research Center. Moccasin, MT.

Selected Varieties	1989	1990 <sup>1/</sup>	1992	1993	1994	1995	1996	1997	1998	Avg.	Hector Same Yrs.
	-----bu/a-----										
Hector	48	31	58	66	47	66	30	69	43	50.9	-
Harrington	45	25	45	62	44	65	31	71	36	47.1	50.9
Lewis	41	34	55	66	44	58	33	76	37	49.3	50.9
Bowman	40	29	56	62	35 <sup>2/</sup>	63	33	64	39	46.8	50.9
Gallatin	39	34	53	58	48	56	30	67	39	47.1	50.9
Chinook	43	38	48	68	40	68	28	73	43	49.9	50.9
Stark		35	58	60	38	58	32	70	42	49.1	51.3
Baronesse			59	76	44	63	33	73	44	56.0	54.1
<b>Nursery Mean</b>	<b>44.1</b>	<b>31.9</b>	<b>52.6</b>	<b>64.3</b>	<b>42.1</b>	<b>63.5</b>	<b>30.6</b>	<b>71.7</b>	<b>41.8</b>		
<b>Growing Season</b>											
Precip. (in.)	<b>10.4</b>	<b>6.4</b>	<b>9.1</b>	<b>12.1</b>	<b>8.0</b>	<b>13.4</b>	<b>5.7</b>	<b>11.3</b>	<b>9.4</b>		
April Precip. (in.)	2.6	1.2	1.0	1.2	2.1	2.3	1.0	1.4	0.6		
May Precip. (in.)	1.8	3.3	1.4	0.9	3.1	3.8	3.1	2.0	1.9		
June Precip. (in.)	2.4	0.9	3.5	4.2	1.7	3.7	1.3	4.1	4.8		
July Precip. (in.)	3.4	1.1	3.1	5.7	1.1	3.6	0.3	3.7	2.1		

1991 Variety trial was severely damaged by hail.

1/ 1990 Variety trial was planted on fallow – all other years the trial was on re-crop no-till.

2/ Bowman experienced animal damage in the 1994 trial.

Table 7. 1998 Moccasin Re-crop Durum Variety Trial – Exp. 9876. Central Agricultural Research Center. Moccasin, MT.

Id	Variety/Line	Grain Yield (bu/a)	Test Weight (lbs/bu)	Heading Date (Julian <sup>1/</sup> )	Plant Height (in.)	Stand (%)	Protein Content (%)
CI 17789	VIC	35.2	60.2	188	38	86.7	15.7
97DU2	933 (NWC <sup>2/</sup> )	35.2	60.9	186	27	76.7	15.1
WPBLaker	LAKER	34.2	60.8	190	28	80.0	13.9
DT 380	SCEPTRE	33.4	58.8	187	35	78.3	15.6
PI478289	MONROE	32.9	60.1	185	34	80.0	15.4
NDMunich	MUNICH	32.8	59.8	187	30	80.0	16.0
D87130	BEN	32.6	60.8	189	35	81.7	16.0
PI476211	LLOYD	32.1	59.8	191	26	78.3	13.4
PI574642	MCNEAL	32.1	58.4	187	30	71.7	15.3
CANPlenty	PLENTY	31.7	60.7	189	37	80.0	15.7
NDBelzer	BELZER	31.0	60.0	189	35	76.7	14.6
CANKyle	KYLE	30.9	59.1	189	40	81.7	16.2
NPB87	NPB871104E	30.8	57.8	190	27	70.0	15.9
CI 17282	CROSBY	29.7	59.3	186	37	71.7	16.9
PH894401	Laker/Westbred881	29.4	60.9	185	25	78.3	14.9
DT 433	MEDORA	29.4	60.1	187	36	78.3	16.2
PI510696	RENVILLE	29.0	58.7	189	36	75.0	15.4
CI 15892	WARD	27.2	59.9	187	35	80.0	16.1
97DU1	DURFORT (NWC <sup>2/</sup> )	27.1	58.9	188	24	71.7	15.4
Experimental Means		31.4	59.7	187.8	32.5	77.7	15.5
F Test for Var. (df=18)		2.9**	5.9**	9.1**	45.6**	1.0ns	-
C.V. 1: (S/Mean) *100		7.7	1.1	0.5	4.0	9.6	-
LSD (0.05)		4.0	1.1	1.6	2.1	12.3	-

\* Note: This year's nursery experienced uneven germination and hot, dry conditions during heading, all which may have contributed to lower yields and test weights.

1/ Number of days from Jan. 1 (180 = June 29).

2/ NWC = NW Consortium

\*\* Denotes Statistical Significance at  $P \leq 0.01$

ns Denotes NO Statistical Significance at  $P \leq 0.05$

Planted: 4/27/1998 no-till into Lewis barley stubble.

Harvested: 8/19/1998

Fertilizer: 90# N post-plant broadcast, 35# N broadcast pre-heading (7/3/98)

Growing Season Precipitation (April – July): 9.35" – 90 year avg.: 8.69"

<u>April</u>	<u>May</u>	<u>June</u>	<u>July</u>
0.59"	1.89"	4.79"	2.08"

Table 8. Moccasin Re-crop Durum Multi-Year Yield Summary of Selected Varieties, 1996-1998. Central Agricultural Research Center. Moccasin, MT.

Selected Varieties	1996	1997	1998	Average
-----bu/a-----				
Lloyd	24	54	32	36.7
Monroe	23	56	33	37.3
Laker	23	50	34	35.7
Medora	23	51	29	34.3
Ben	23	53	33	36.3
Renville	22	59	29	36.7
Ward	22	50	27	33.0
Kyle	21	56	31	36.0
Vic	21	58	35	38.0
Voss	21	59		40.0
Plenty	20	56	32	36.0
Munich	20	57	33	36.7
Crosby	20	57	30	35.7
Sceptre			33	33.0
McNeal	24	65	32	40.3
<b>Nursery Mean</b>	<b>21.8</b>	<b>55.0</b>	<b>31.4</b>	
Growing Season Precip. (in.)	5.7	11.3	9.4	
April Precip. (in.)	1.0	1.4	0.6	
May Precip. (in.)	3.1	2.0	1.9	
June Precip. (in.)	1.3	4.1	4.8	
July Precip. (in.)	0.3	3.7	2.1	

Table 9. 1998 Montana Spring Oat Statewide Nursery – Exp. 0407. Central Agricultural Research Center. Moccasin, MT.

Id	Variety/Line	Grain Yield		Test Weight (lbs/bu)	Heading Date (Julian <sup>2/</sup> )	Plant Height (in.)	Protein Content (%)	Stand (%)
		(bu/a <sup>1/</sup> )	(lbs/a)					
CI483126	Monida	88.3	2827	36.5	196	31	10.0	80.0
ND860416	Otana/Valley	87.9	2812	39.0	192	33	10.3	85.0
90Ab1322	80Ab1322/Monida	78.6	2516	37.6	191	25	11.5	76.7
ND870258	Whitestone	78.5	2515	37.8	192	29	10.8	73.3
CI 9252	Otana	78.3	2507	39.0	190	35	10.0	81.7
86AB664	Ogle/75Ab861	73.0	2338	36.5	191	28	9.8	73.3
86AB4582	Monida/Reselection	72.8	2332	37.4	191	31	11.0	78.3
83AB3250	Powell	72.3	2316	34.6	197	25	11.6	76.7
CELSIA	Celsia	71.5	2288	36.5	195	31	10.7	73.3
PRAIRIE	Prairie	70.7	2264	36.0	188	29	11.4	71.7
87AB5125	Ogle/75Ab861	69.9	2236	38.2	193	24	11.0	78.3
81Ab5792	Rio Grande	65.1	2084	35.5	189	27	11.5	83.3
82Ab1142	Ajay	63.5	2031	37.6	191	23	12.0	81.7
ABSP 9-2	83/Ab3119/Monida	61.9	1983	36.4	192	28	11.5	75.0
Experimental Means		73.7	2361	37.0	191.8	28.5	10.9	77.7
F-Value for Var. (df = 13)		5.5**	5.5**	3.6**	13.1**	13.2**	-	1.5ns
CV 1: (S/Mean)*100		8.0	8.0	3.1	0.5	5.7	-	7.7
LSD (0.05)		9.9	317	2.0	2.0	2.7	-	10.0

1/ Oat grain yield (bu/a) is based on 32 lb/bu as the standard test weight.

2/ Number of days from Jan. 1 (190 = July 9) - \*Note: only two reps of data taken due to uneven and late germination of the 3<sup>rd</sup> rep.

Planted: 4/27/1998 no-till into 'Lewis' barley stubble.

Harvested: 8/19/1998

Fertilizer: 60# N post-plant, 35# N broadcast pre-heading (7/3/1998).

Growing Season Precipitation (April – July): 9.35” – 90 year avg.: 8.69”

**Table 10. Moccasin Re-crop Spring Oat Multi-Year Yield Summary of Selected Varieties, 1992-1998. Central Agricultural Research Center. Moccasin, MT.**

Selected Varieties	1992	1993	1994	1995	1996	1997	1998	Avg.	Otana Same Yrs.
	-----lbs/a-----								
Otana	3521	2917	1838	3402	2102	3262	2507	2793	-
Rio Grande	3318	3098	1860	3405	2211	3156	2084	2733	2793
Ajay	3295	2378	1483	3322	1846	2978	2031	2476	2793
Monida	3728	3251	1809	3360	1850	3570	2827	2914	2793
90Ab1322			1935	3366	2016	3682	2516	2703	2622
Whitestone				3373	1850	3519	2515	2814	2818
Powell				3101	1962	3382	2316	2690	2818
ND860416					1990	3591	2812	2798	2624
86AB4582					1997	3809	2332	2713	2624
<b>Nursery Mean</b>	<b>3426</b>	<b>2800</b>	<b>1926</b>	<b>3041</b>	<b>1799</b>	<b>3396</b>	<b>2361</b>		
<b>Growing Season</b>									
Precip. (in.)	9.1	12.1	8.0	13.4	5.7	11.3	9.4		
April Precip. (in.)	1.0	1.2	2.1	2.3	1.0	1.4	0.6		
May Precip. (in.)	1.4	0.9	3.1	3.8	3.1	2.0	1.9		
June Precip (in.)	3.5	4.2	1.7	3.7	1.3	4.1	4.8		
July Precip. (in.)	3.1	5.7	1.1	3.6	0.3	3.7	2.1		

**Table 11. Moccasin Re-crop Spring Oat Multi-Year Test Weight Summary of Selected Varieties, 1992-1998. Central Agricultural Research Center. Moccasin, MT.**

Selected Varieties	1992	1993	1994	1995	1996	1997	1998	Avg	Otana Same Yrs.
	-----lbs/bu-----								
Otana	36.8	31.1	37.1	35.5	35.4	39.3	39.0	36.3	-
Rio Grande	38.0	32.3	35.3	35.8	31.3	36.3	35.5	34.9	36.3
Ajay	37.8	30.5	33.7	36.6	33.9	37.4	37.6	35.4	36.3
Monida	36.0	31.3	35.4	33.1	31.5	37.9	36.5	34.5	36.3
90Ab1322			36.1	34.8	30.4	38.5	37.6	35.5	37.3
Whitestone				34.9	34.3	37.8	37.8	36.2	37.3
Powell				32.1	30.5	35.7	34.6	33.2	37.3
ND860416					37.1	38.8	39.0	38.3	37.9
86AB4582					32.2	38.6	37.4	36.1	37.9
<b>Nursery Mean</b>	<b>36.1</b>	<b>31.8</b>	<b>35.6</b>	<b>34.5</b>	<b>34.7</b>	<b>37.4</b>	<b>37.0</b>		
<b>Growing Season</b>									
Precip. (in.)	9.1	12.1	8.0	13.4	5.7	11.3	9.4		
April Precip. (in.)	1.0	1.2	2.1	2.3	1.0	1.4	0.6		
May Precip. (in.)	1.4	0.9	3.1	3.8	3.1	2.0	1.9		
June Precip (in.)	3.5	4.2	1.7	3.7	1.3	4.1	4.8		
July Precip. (in.)	3.1	5.7	1.1	3.6	0.3	3.7	2.1		

All variety trials have been planted no-till on re-crop ground.