PROJECT TITLE: Evaluation of winter and spring cereals under a no-till recrop environment at Moccasin and Grass Range.

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OBJECTIVES:
To evaluate the performance of spring and winter grain varieties in no-till recrop environment at Moccasin, and oat varieties at Grass Range. To determine yield potential of barley, spring wheat, winter wheat, and oat varieties under recrop environment.

RESULTS:
The winter wheat variety trial was abandoned due to uneven stand resulting from extremely wet conditions during seeding. Variety trials were planted into barley stubble (4th consecutive barley crop). Volunteer barley was a problem. The spring wheat variety trial had a 19% infestation of barley, by weight. While growing season precipitation (April-July) was 92% of normal, June and July averaged only 58% of normal. Lack of precipitation, along with warm temperatures from mid July to harvest resulted in yields averaging from near normal to well below normal. Barley yields ranged from 52 to 35 bu/a with an average test weight of 48 lbs/bu. Spring wheat yields ranged from 25 to 19 bu/a with test weights averaging 57 lbs/bu. Oat variety yields were considerably below the 3 year average ranging from 2324 to 1461 lbs/a, with test weights averaging 35 lbs/bu. For the third consecutive year an oat variety trial was grown on recrop near Grass Range. Yields were also well below their 3 year average at this location. Data for the 1994 variety trials, as well as multi-year summaries, are presented in Tables 1-8.

SUMMARY:
At Moccasin, cereal varieties which perform well under crop-fallow conditions tend to perform well under recrop conditions. The performance of a variety on a given year was more a factor of that year's weather than whether it was planted on recrop or fallow.

FUTURE PLANS:
Winter and spring cereal no-till variety trials will be continued on station.

Table 1 1994 CARC No-Till Spring Barley Trial
Exp. 3673 Central Agricultural Research Center, Moccasin, MT.

ID#	Variety	Grain Yield	Test Weight	Plant Ht.	Heading Date	Protein Content
		bu/a	lbs/bu	"	day	%
MT889106	Apex/Lewis	51.6	51.0	27	177	12.6
PI491534	Gallatin	47.8	49.0	25	183	12.0
MT851195	MT851195	46.7	49.2	24	184	13.9
CI 15514	Hector	46.5	49.4	24	185	12.4
SK 76333	Harrington	44.4	46.4	24	185	12.1
NS 78054	Baronesse	44.4	49.8	22	189	13.0
CI 15856	Lewis	44.0	49.8	23	186	14.2
PI537967	Colter	42.8	44.0	21	180	10.5
MT861596	Lewis/MT 41549	42.7	49.8	25	186	12.6
MT890008	MT890008	40.9	46.6	22	189	12.6
MT140523	MT140523	39.8	48.0	22	188	13.5
MT860756	MT860756	39.1	49.4	23	185	13.3
CI 9558	Piroline	39.1	49.8	23	181	13.0
MT886610	MT 81143/Lewis	39.1	46.9	24	186	12.3
CI 15229	Steptoe	37.9	41.7	23	176	11.9
ND 9866	Stark	37.8	51.1	25	180	12.2
WPB92 1	Medallion	37.5	45.7	18	187	13.1
PI483237	Bowman	35.5	50.4	26	177	12.3
EXPERIMENTAL MEANS		42.09	48.22	23.31	183.65	12.65
F TEST FOR VAR. df=34		1.39	26.75	3.27	19.38	2.72
C.V. 1: (S/MEAN)*100		14.94	1.76	8.16	.90	6.98
LSD (0.05)		10.43	1.41	3.16	2.74	1.46

The trial was infested with volunteer barley. The no-till spring wheat variety trial, which was located beside the barley study, had a 19.14% infestation of volunteer barley.

Planted: 4-19-94 no-till on barley stubble (4th consecutive barley crop).
Harvested: 8-8-94
Fertilizer: 50# 28-28-0 w/seed, 45 N Urea broadcast prior to seeding.
Growing season Precipitation (April-July): 8.01 inches.

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Table 2 Moccasin Off-Station Barley Multi-Year Summary
Central Agricultural Research Center, Moccasin, MT.

Variety	1983 *	1984 *	1985 *	1985 **	1989 **	1990	1992 **	1993 **	1994 **	Ave.	Hector Same Yrs
						bu/a					
HECTOR	42	27	26	18	48	31	58	66	47	40	--
PIROLINE	43	27	22	18	45	30	52	60	39	37	40
HARRINGTON	39	26	8	6	45	25	45	62	44	33	40
CLARK	45	25	17	12	40	32	49	57		35	39
LEWIS	43	26	20	16	41	34	55	66	44	38	40
BOWMAN			26	26	40	29	56	62	35#	39	42
STEPTOE			25	23	46	33	52	71	38	41	42
GALLATIN		30	18	15	39	34	53	58	48	37	40
BEARPAW					44	34	49	63		47	51
MT860756							50	65	39	51	57
MT 140523					43	38	48	68	40	47	50
STARK						35	58	60	38	48	50
BARONESSE							59	76	44	60	57
COLTER								54	43	48	56
Mean	39.3	26.2	17.6	14.6	44.1	31.9	52.6	64.3	42.1		

* Recrop
** No-Till

1990 Variety trial was planted on fallow ground.
1991 Variety trial on no-till barley stubble experienced severe hail damage.
#Bowman experienced animal damage in 1994 trial.

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Table 3 1994 CARC Recrop Spring Wheat Variety Trial
Exp. 9970 Central Agricultural Research Center, Moccasin, MT.

ID#	Variety	Heading Date	Plant Ht.	Grain Yield	Test Weight
		day	"	bu/a	lbs/bu
CI 17430	NEWANA	185	24	25.5	57.9
CI 17904	OWENS	183	22	24.6	56.9
CI 13596	FORTUNA	184	27	24.1	54.0
CANLANC	LANCER	183	25	24.0	58.0
PI483235	GLENMAN	185	23	23.8	55.5
ND 606	AMIDON	183	26	23.5	58.7
WA 6920	PENAWAWA	181	22	23.1	56.9
WPB 926	WESTBRED 926	178	23	23.1	56.3
CI 17790	LEN	184	24	22.8	57.6
PI486139	KLASIC	176	19	22.7	56.5
C982-324	RAMBO	185	22	22.6	59.2
CI 17828	PONDERA	182	26	22.3	57.5
PI574642	MCNEAL	184	22	21.9	54.4
PI549275	HI-LINE	179	24	21.4	56.5
ND 677	ND622*2/CUTLESS	182	27	21.4	59.5
ND 582	STOA	183	25	21.2	56.8
BZ984326	BORDER	180	23	20.7	53.9
CI 17429	LEW	185	26	20.5	57.7
ND 626	GRANDIN	182	23	20.5	57.3
NDCUT	CUTLESS	183	24	19.2	58.8
OVERALL MEAN		182.3	23.97	22.44	56.99
F-RATIO TRTS df=38		27.94	2.53	.87	5.84
CV (S/MEAN) %		.44	9.31	13.28	2.02
LSD(0.05 by t)		1.33	3.69	4.93	1.90

The trial had a heavy infestation of volunteer barley, averaging 19.14% barley by weight.

Planted: 4-19-94 no-till on barley stubble (4th consecutive barley crop).
Harvested: 8-15-94
Fertilizer: 50# 28-28-0 w/seed, 45 N Urea broadcast prior to seeding.
Growing season precipitation (April-July): 8.01 inches.

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Table 4 Moccasin Off-Station Spring Wheat Multi-Year Summary
Central Agricultural Research Center, Moccasin, MT.

Variety	1983 *	1984 *	1985 *	1985 **	1989 **	1990	1992 **	1993 **	1994 **	Ave.	Newana Same Yrs
	bu/a										
OLAF	22	15			39	18	24	44		27	31
AMIDON					39	20	35	55	23	34	34
PENAWAWA					45	24	39	64	23	39	34
LEN					34	19	27	47	23	30	34
OWENS		15			48	23	32	60	25	34	31
STOA		17	14	14	40	20	31	46	21	25	27
GLENMAN	26	18	15	13	43	21	36	47	24	27	27
WESTBRED 926R						20	29	51	23	31	32
GRANDIN						22	30	54	20	31	32
LANCER					33	24	32	44	24	31	34
FORTUNA	23	15	10	9	35	15	27	44	24	22	27
RAMBO					39	21	34	43	23	32	34
LEW	26	18	12	12	36	18	34	46	20	25	27
PONDERA	23	16			39	19	31	43	22	28	30
KLASIC							26	41	23	30	36
NEWANA	25	17	14	15	42	19	35	48	25	27	--
CUTLESS					36	23	24	42	19	29	34
HI-LINE					39	19	29	49	21	31	34
MCNEAL							39	52	22	38	36
Mean	24.2	16.8	12.9	12.6	39.6	20.4	31.1	48.1	22.4		

* Recrop
** No-till

1990 Variety trial on fallow.
1991 Variety trial on no-till barley stubble experienced severe hail damage.

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Table 5 1994 CARC Recrop Oat Variety Trial
Exp. 0407 Central Agricultural Research Center, Moccasin, MT.

Variety	Plant Ht.	Heading Date	Grain ---Yield---		Test Weight	Dry Matter
	"	day	bu/a	lbs/a	lbs/bu	ton/a
Cayuse	24	184	72.6	2324	34.0	1.55
Robert	27	186	72.3	2313	34.9	1.91
Newdak	28	178	67.3	2155	35.9	1.46
Ogle	26	179	66.9	2142	35.7	1.85
Calibre	29	186	62.9	2013	36.1	2.22
Valley	23	184	62.8	2010	37.1	1.33
Border	21	187	61.0	1951	34.4	1.24
80Ab988/Monida	20	187	60.5	1935	36.1	.94
Park	27	182	60.4	1933	34.8	1.55
Settler	28	179	59.7	1911	38.9	1.72
Troy	30	182	59.1	1890	35.9	2.21
Derby	28	184	58.6	1874	35.6	1.76
Rio Grande	20	181	58.1	1860	35.3	1.25
Otana	26	184	57.4	1838	37.1	1.26
Monida	26	187	56.5	1809	35.4	1.36
Appaloosa	23	185	55.5	1776	33.6	1.12
Ajay	17	187	46.3	1483	33.7	.81
Riel	26	184	45.7	1461	36.2	1.22
EXPERIMENTAL MEANS	24.87	183.65	60.20		35.59	1.49
F TEST FOR VAR. df=34	5.67	30.55	1.51		5.25	2.83
C.V. 1: (S/MEAN)*100	10.44	.50	16.74		2.79	22.41
LSD (0.05)	4.31	1.52	16.72		1.65	.70

The trial was infested with volunteer barley. The no-till spring wheat variety trial, which was located nearby, had a 19.14% barley infestation.
Grain yield (bu/a) based on 32 lb/bu as standard test weight.
Planted: 4-19-94 no-till on barley stubble (4th consecutive barley crop).
Harvested: 7-29-94 for forage (1 row).
8-3-94 for grain (2 rows).
Fertilizer: 50# 28-28-0 w/seed, 45 N Urea broadcast prior to seeding.
Growing season precipitation (April-July): 8.01 inches.

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Table 6 1994 Grass Range Recrop Oat Variety Trial
Exp. 0475 Central Agricultural Research Center, Moccasin, MT.

Variety	Plant Ht.	Grain ----Yield--- bu/a	Grain ----Yield--- lbs/a	Test Weight lbs/bu
	"			
RioGrande	19	31.1	996	38.2
Newdak	21	30.3	970	35.4
Calibre	23	30.1	964	33.6
80Ab988/Monida	18	28.5	913	38.7
Valley	20	28.4	909	38.2
Cayuse	19	27.8	891	35.8
Appaloosa	20	27.8	891	33.9
Robert	22	27.7	885	34.3
Riel	25	27.4	878	37.5
Troy	22	26.8	857	35.3
Monida	20	26.8	857	33.5
Ogle	21	26.3	843	35.7
Derby	21	25.8	826	33.9
Settler	22	25.1	802	39.4
Border	18	24.8	793	31.2
Otana	22	24.5	785	36.2
Park	23	23.6	756	32.3
Ajay	17	23.5	751	37.2
Haybet Barley*		19.2	922	41.9
EXPERIMENTAL MEANS	20.72	27.02		35.57
F TEST FOR VAR. df=34	3.72	1.31		23.13
C.V. 1: (S/MEAN)*100	8.57	12.51		2.32
LSD (0.05)	2.95	5.61		1.37

*Haybet barley was planted on one end (not randomized) and is not included in the means. Haybet yield (bu/a) is based on 48 lb/bu as standard test weight.
Oat grain yield (bu/a) based on 32 lb/bu as standard test weight.
Planted: 5-11-94 on recrop barley ground
Harvested: 8-12-94
Fertilizer: 50# 28-28-0 w/seed.
Growing Season Precipitation (April-July): 6.25 inches.
Producer: Larry, Pat, and Dennis Descheemaeker, Grass Range, MT.

File: AROATS94.OAD

Table 7 CARC Off-Station Recrop Oats Multi-Year Summary
Central Agricultural Research Center, Moccasin, MT.

Variety	1992	1993	1994	Ave.
	---------- Grain Yield - lbs/ac ----------			
Appaloosa	3657	2747	1776	2727
Border	3595	2662	1951	2736
Calibre	3938	3172	2013	3041
Cayuse *	3447	2875	2324	2882
Derby	3746	2769	1874	2796
Monida *	3728	3251	1809	2929
Newdak	3432	2892	2155	2826
Ogle	2886	2609	2142	2546
Otana *	3521	2917	1838	2759
Park *	3346	2484	1933	2588
Riel	3378	2954	1461	2598
Rio Grande	3318	3098	1860	2759
Robert	3603	3591	2313	3169
Valley	3072	2596	2010	2559
Mean	3426.1	2800.3	1926.4	

Table 8 Grass Range Off-Station Recrop Oats Multi-Year Summary
Central Agricultural Research Center, Moccasin, MT.

Variety	1992	1993	1994	Ave.
	---------- Grain Yield - lbs/ac ----------			
Appaloosa	1796	3030	891	1906
Border	1857	2918	793	1856
Calibre	1773	2810	964	1849
Cayuse *	1543	2912	891	1782
Derby	2081	2703	826	1870
Monida *	1799	3146	857	1934
Newdak	1415	2543	970	1643
Ogle	1466	2342	843	1550
Otana *	1786	2774	785	1782
Park *	1597	2521	756	1625
Riel	1671	2209	878	1586
Rio Grande	1600	2838	996	1811
Robert	1773	2549	885	1736
Valley	1472	2463	909	1615
Mean	1645.1	2597.8	864.6	

*Recommended Variety

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