Title: Small grain variety performance under no-till conditions.

Year: 1999.

Location: Western Triangle Research Center, Conrad, MT.

Personnel: Gregory D. Kushnak, Research Center, Conrad; Luther Talbert and Tom Blake, MSU Plant Science Dept.

Objectives: Identify small grain varieties which are adapted to no-till conditions.

Methods: Spring wheat and barley varieties were no-till planted into barley stubble at right angles to the previous crop. Crop history for the site was barley in 1998, fallow in 1997, and barley in 1996. Planting was accomplished with a double-disk no-till plot planter constructed by our Research Center Staff. Row space was 12 inches. Fertilizer included 60 pounds/acre ammonium phosphate (11-52-0) and 60 pounds/acre actual nitrogen top-dressed as urea. Roundup herbicide was used for preplant weed & volunteer control. Hoelon and Bronate herbicides were used for wild oat and broadleaf control, respectively.

Results: Data for 1999, along with 5-year averages, are presented in Tables 1 and 2 for spring wheat, and Tables 3 and 4 for barley. Rainfall was 83% of normal for the growing season, but cool temperatures relieved stress and allowed for fairly good wheat yield with only slightly reduced test weight. Barley yield, test weight and kernel plump were exceptionally high for continuous-crop conditions.

McNeal spring wheat, normally a high ranking yielder under fallow conditions, was among the lowest performers for yield and test weight under these recrop conditions. Likewise, Amidon ranked low. Both of these varieties had later maturity than most other entries, which likely contributed to their poor performance under re-crop. Some of the other late maturing varieties, however, yielded quite well in this trial.

Among the barleys, Baroness was the top yielding variety, along with one of its progeny lines (MTLB13). This is consistent with previous years re-crop performance. The malt types Chinook and Harrington maintained good kernel plump, with Chinook placing among the top yielders.

Future Plans: Continue the no-till continuous-crop variety evaluations in efforts to include seasons of disease and environmental stress.

Table 1. **Dryland Recrop No-till Spring Wheat** variety trial grown north of **Conrad**, 1999. Mont. Agr. Expt. Station. Western Triangle Ag. Research Center, Conrad, Montana.

Variety		Yield bu/ac.	Test wt. lbs/bu.	Plant hgt. inches	Head date	% protein
PARSHALL		46.1	62.0	35	182	12.8
WESTBRED 936		45.5	61.2	29	182	13.0
WESTBRED 926		43.0	61.2	29	182	13.5
PNR 2375		42.5	60.7	33	180	13.0
CONAN	*	41.9	60.3	29	182	13.1
MTHW9701		41.7	59.6	28	182	12.1
REEDER		41.6	61.7	30	182	12.5
HI-LINE		41.3	61.3	27	182	12.8
ERNEST	*	41.2	61.5	33	184	12.6
RAMBO	*	40.7	61.8	30	185	11.6
FERGUS		40.7	60.0	30	182	13.6
SCHOLAR	*	40.5	61.7	35	183	13.0
NEWANA		40.0	60.7	28	185	11.2
GRANDIN		38.8	60.8	31	184	12.9
WESTBRED EXPRESS		38.5	60.4	26	182	12.9
LEW	*	38.5	61.1	24	184	11.7
MTHW9420		37.4	59.1	28	182	11.2
MCNEAL		37.3	59.8	30	183	12.1
FORTUNA	*	36.7	60.7	34	183	12.3
AMIDON	*	33.4	57.9	34	183	12.4

Cooperator: Western Triangle Ag. Research Center.
Location: Ten miles north of Conrad, MT. (Pondera County)
Fertilizer: 60# 11-52-0 with the seed, + 60# N topdressed.
Previous crop: Barley.
Date seeded: April 12, 1999, into no-till standing stubble.
Date harvested: August 30, 1999.
Rainfall: From seeding to harvest was 7.8 inches.
* = Sawfly resistant varieties. (Amidon, Conan, Rambo and Scholar have partial resistance.)
Yield experimental mean: 40.37
Error degrees of freedom: 38
F test for var: 2.13
C.V. 2: 5.03
LSD (0.05): 5.81

Table 2. **Five-year summary** for **No-till Recrop Spring Wheat** varieties grown near **Conrad, MT.** 1995 - 1996 - 1997 - 1998 - 1999. Mont. Agr. Expt. Station, Western Triangle Agr. Research Center, Conrad, MT.

Variety		5 - year comparable average				
		Yield bu/ac	Test wt lbs/bu	Plant hgt. inches	Head date 1/	% Protein
WESTBRED 936		49.8	60.9	28	178	12.6
RAMBO	*	48.9	61.5	30	181	11.8
SCHOLAR	*	47.5	62.0	35	179	12.7
HI-LINE		47.1	62.1	30	178	12.3
NEWANA		47.1	61.4	31	181	11.3
FERGUS		46.8	61.3	30	178	12.8
WESTBRED EXPRESS		46.8	60.9	27	178	12.7
AMIDON	*	46.3	60.7	36	179	12.5
WESTBRED 926		46.2	60.8	30	177	12.8
ERNEST	*	45.7	62.2	36	179	12.9
MCNEAL		45.4	60.6	33	180	12.5
PIONEER 2375		44.9	61.6	33	178	12.5
MTHW9420 (hard wh.)		44.6	60.3	30	178	12.1
GRANDIN		43.2	61.4	34	180	12.9
LEW	*	42.5	61.7	35	181	12.1
FORTUNA	*	42.2	61.6	37	180	12.6

Cooperator: Western Triangle Ag. Research Center.
Location: North of Conrad, MT. (Pondera County)
* = Sawfly resistant varieties. (Amidon, Rambo and Scholar have partial resistance.)
1/ = Head dates based on 3 years average. (1995 -1998- 1999)

Table 3. **Dryland Recrop No-till Barley** variety trial grown north of **Conrad**, 1999. Mont. Agr. Expt. Station, Westerm Triangle Ag. Research Center, Conrad, MT.

Variety	Yield bu/ac	TestWt lbs/bu	Plant hgt. inches	% Plump	% Thin	Head date	% Protein
MTLB 13	75.3	52.9	28	89	3	182	12.4
Baronesse	75.3	51.8	28	85	4	183	10.1
MT960228	74.1	51.2	30	72	7	182	10.6
Chinook	71.4	52.3	30	90	4	182	10.9
MT920073	70.9	52.6	30	90	3	181	11.3
Gallatin	70.6	50.8	29	94	2	181	10.7
Xena	70.1	52.8	28	81	5	182	11.4
MTLB 5	70.0	52.6	29	94	2	183	11.0
Hector	68.5	51.9	30	85	4	181	10.6
MT950186	67.8	54.0	31	90	3	182	10.3
Valier	67.7	53.4	30	75	7	183	11.0
Bowman	66.3	52.1	28	96	1	180	11.0
MTLB 6	66.1	52.1	29	92	2	182	11.4
Harrington	65.7	51.4	29	94	1	184	10.9
Lewis	64.7	52.9	29	77	7	183	11.6
Stark	64.6	53.3	30	93	2	180	10.8

Cooperator: Western Triangle Ag. Research Center.
Location: Ten miles north of Conrad, MT. (Pondera County)
Fertilizer: 60# 11-52-0 with the seed, + 60# N actual top-dressed after planting.
Previous crop: Barley.
Method of seeding: Double-disc drill into standing stubble.
Date seeded: April 12, 1999.
Date harvested: August 10, 1999.
Rainfall: From seeding to harvest was 6.01 inches.
Yield experimental mean: 69.32
Error degrees of freedom: 30
F test for var.: 0.74
C.V. 2: 5.9
LSD (0.05): 11.8

Table 4. **Five-year** summary for **Recrop Dryland No-Till Barley** varieties grown north of **Conrad, MT.** 1995 - 1996 - 1997 - 1998 - 1999. Mont. Agr. Expt. Station, Western Triangle Agr. Res. Center, Conrad, MT.

	5 - year comparable average						
Variety	Yield bu/ac	Tst wt lbs/bu	Plant hgt. inches	% Plump	% thin	Head date *	% Protein
BARONESSE	80.4	51.1	28	81	7	180	10.1
STARK	70.0	52.6	31	93	2	178	10.6
GALLATIN	69.6	51.8	30	84	5	179	10.3
HARRINGTON	67.6	49.2	29	83	5	180	10.4
BOWMAN	67.0	51.7	30	92	2	176	11.1
HECTOR	66.9	50.7	32	78	8	180	10.7
LEWIS	64.8	52.1	30	80	7	180	11.1
CHINOOK	64.3	50.4	30	77	8	180	10.9

Cooperator: Western Triangle Ag. Research Center.
Location: Ten miles north of Conrad, MT. (Pondera County)
* = Head dates based on 3 years average. (1995-98-99)