

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

Year: 1998.

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 1997, fallow in 1996, and barley in 1995. Planting was accomplished with a double-disk no-till plot planter constructed by our Research Center Staff. Row space was 12 inches. Fertilizer included 100 pounds/acre ammonium phosphate (11-52-0) and 100 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 1998, along with 5-year averages, are presented in Tables 1 and 2 for spring wheat, and Tables 3 and 4 for barley. Rainfall was twice the normal amount for June and July, followed by very hot dry conditions in late July and August. This weather pattern resulted in reduced test weight and kernel plump.

Spring wheat varieties that were able to maintain 60-pound or better test weight under these conditions included Amidon, Newana, Ernest, Scholar, HiLine and Lew. The 111 pounds of added nitrogen fertilizer was insufficient, and proteins averaged about 10%.

Among the barleys, Baroness was the top yielding variety, but was surpassed by three of its progeny lines (MTLB). The MTLB lines carry the Baroness yield gene, but are slightly earlier to mature. The earlier maturity may explain the yield advantage under these moisture-depleted conditions.

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

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Table 1. Dryland Recrop No-till Spring Wheat variety trial grown north of Conrad, 1998. 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
AMIDON	*	38.4	60.8	37	173	10.0
NEWANA		36.4	61.1	29	176	9.1
STOA		35.8	59.8	35	174	10.4
WESTBRED 926		35.7	58.8	29	171	10.6
MCNEAL		35.6	59.3	32	175	10.3
ERNEST	*	35.5	60.2	35	173	10.8
WESTBRED 936		35.2	59.7	27	171	10.1
RAMBO	*	35.1	59.7	28	175	10.6
MT 9609		34.6	59.6	34	173	10.8
SCHOLAR (9433)	*	34.0	61.0	34	174	10.4
HI-LINE		33.9	60.3	29	172	10.1
LEW	*	33.6	60.5	37	176	10.3
FERGUS		33.5	58.8	29	171	11.9
TRENTON		33.4	59.8	37	174	10.5
GRANDIN		33.2	59.3	32	173	10.4
GLENMAN	*	33.1	59.1	32	176	10.0
MTHW9420		32.2	57.0	31	172	11.4
PIONEER 2375		32.1	58.6	33	173	11.1
WESTBRED EXPRESS		31.6	58.0	27	175	11.0
FORTUNA	*	31.4	59.2	34	174	10.8
LEN		31.0	58.6	30	175	11.5

Cooperator: Western Triangle Ag. Research Center.

Location: Ten miles north of Conrad, MT. (Pondera County)

Fertilizer: 100# 11-52-0 with the seed, + 100# N topdressed.

Previous crop: Barley.

Date seeded: April 22, 1998.

Date harvested: August 10, 1998.

Rainfall: From seeding to harvest was 8.39 inches.

* = Sawfly resistant varieties. (Amidon, Rambo and Scholar have partial resistance.) (also most experimental lines are resistant).

Yield experimental mean: 34.06

Error degrees of freedom: 40

F test for var: 1.45

C.V. 2: 4.54

LSD (0.05): 4.42

Table 2. Five-year summary for No-till Recrop Spring Wheat varieties grown near Conrad, MT. 1994 - 1995 - 1996 - 1997 - 1998. 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 @	% Protein
GLENMAN *	47.0	58.6	30	180	11.3
WESTBRED 936	46.7	58.8	27	176	12.2
RAMBO *	46.5	59.3	29	179	11.5
AMIDON *	45.2	59.5	35	178	12.1
SCHOLAR (MT 9433) *	45.1	60.0	34	178	12.2
WESTBRED EXPRESS	44.9	59.0	27	177	12.2
NEWANA	44.8	59.8	30	180	11.1
FERGUS	44.4	59.6	29	176	12.2
HI-LINE	43.8	60.2	29	176	12.0
WESTBRED 926	43.6	58.6	29	175	12.1
MCNEAL	43.3	58.7	32	178	12.2
STOA	43.1	59.1	35	179	11.8
ERNEST *	42.9	60.3	36	178	12.4
LEN	42.2	58.4	31	179	12.1
PIONEER 2375	41.7	59.8	32	177	12.0
TRENTON	41.3	59.8	33	178	12.3
GRANDIN	40.9	59.6	33	178	12.4
LEW *	40.3	59.9	36	180	11.8
FORTUNA *	39.9	59.9	36	178	12.5

Cooperator: Western Triangle Ag. Research Center.

Location: North of Conrad, MT. (Pondera County)

* = Sawfly resistant varieties. (Amidon, Rambo and Scholar have partial resistance.)

@ = Head dates based on 3 years average. (1994 - 95 - 1998)

Table 3. Dryland Recrop No-till Barley variety trial grown north of Conrad, 1998. Mont. Agr. Expt. Station, Western Triangle Ag. Research Center, Conrad, MT.

Variety	Yield bu/ac	TestWt lbs/bu	Plant hgt. inches	% Plump	% Thin	Head date	% Protein
MTLB 32	61.5	47.9	26.7	67	7	178	8.3
MTLB 6	61.4	52.0	29.3	86	4	177	9.0
MTLB 57	59.6	48.6	28.7	60	12	177	8.9
Baronesse	58.9	46.8	27.7	48	19	177	8.9
MT920073	57.7	50.8	27.7	85	4	176	8.4
Stark	56.9	51.7	31.0	87	4	173	8.5
MTLB 5	56.4	51.2	28.7	68	7	178	8.3
MT910189	55.6	50.1	27.3	71	8	177	8.2
Gallatin	54.8	52.6	30.3	79	5	177	7.8
Hector	53.9	48.9	31.7	60	14	177	8.7
MT910150	53.6	50.8	30.7	74	8	177	8.9
Lewis	53.0	50.6	30.7	66	11	177	9.0
Chinook	52.9	50.6	29.3	72	9	176	8.7
Bowman	52.8	50.8	30.7	83	4	173	9.4
Logan	52.2	52.1	27.7	88	3	173	8.2
Harrington	50.8	45.6	28.0	69	9	177	8.6

Cooperator: Western Triangle Ag. Research Center.

Location: Ten miles north of Conrad, MT. (Pondera County)

Fertilizer: 100# 11-52-0 with the seed, + 50# N actual top-dressed after planting.

Previous crop: Barley.

Method of seeding: Double-disc drill into standing stubble.

Date seeded: April 22, 1998.

Date harvested: August 6, 1998.

Rainfall: From seeding to harvest was 8.39 inches.

Yield experimental mean: 55.73

Error degrees of freedom: 30

F test for var.: 3.56

C.V. 2: 3.16

LSD (0.05): 5.09

Table 4. **Five-year summary for Recrop Dryland No-Till Barley varieties grown north of Conrad, MT. 1994 - 1995 - 1996 - 1997 - 1998. 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	75.5	51.0	27	75	8	178	10.1
LOGAN	68.1	51.1	30	89	3	175	10.2
STARK	67.4	51.8	29	89	3	176	10.4
GALLATIN	66.2	50.0	29	81	6	178	10.0
BOWMAN	63.2	51.9	29	90	2	176	10.9
HARRINGTON	62.7	48.5	28	76	7	178	10.1
HECTOR	62.2	49.4	31	73	9	179	10.4
LEWIS	60.8	50.3	29	77	8	178	10.8
CHINOOK	59.5	48.9	29	69	11	178	10.8

Cooperator: Western Triangle Ag. Research Center.
 Location: Ten miles north of Conrad, MT. (Pondera County)
 * = Head dates based on 3 years average. (1994-95-98)
 ** = Test weights based on 4 years average. (1994-95-96-97)