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

Year: 1993

Location: Western Triangle Agricultural Research Center, Conrad.

Personnel:

Project Leader: Gregory D. Kushnak

Cooperators: Luther Talbert & Sue Lanning (Spring Wheat)
Tom Blake & Pat Hensleigh (Barley).

Objectives: Identify small grain varieties most 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 1992, fallow in 1991, and barley in 1990. Planting was accomplished with a double-disc no-till plot planter constructed by our Research Center Staff. The double disc openers were supplied by Acra-Plant, Inc., Garden City, KS. Row space was 12 inches. MAP was applied with the seed to provide 51 lbs P_2O_5/a. Ammonium nitrate (34-0-0) was topdressed to provide 60 lbs N/a. Herbicides included Roundup for pre-seeding vegetation control; Hoelon for wild oat control; and Bronate for broadleaf control. Planting date was May 12, 1993.

Results: Growing season rainfall was approximately 2 inches higher than average and the soil moisture depth at planting time was 39 inches. Recrop yields for 1993, however, were similar to the four-year average (Tables 1-4). The amount of applied nitrogen was based on projected yields, which was less than needed for the moisture conditions of 1993. This is reflected in the low proteins for both wheat and barley in 1993 (Tables 1 & 3). Delayed maturity due to the cool, rainy growing season resulted in slight frost damage (and subsequently low test weight) in spring wheat.

The four-year average yield ranking of wheat and barley varieties on no-till (Tables 2 & 4) is very similar to that found on fallow. However, moisture was favorable during the four years included in the Tables, allowing late maturing varieties to reach potential yields. Baronesse barley had the highest yield, but was fairly late to mature (similar to Harrington) (Tables 3 & 4). Thus Baronesse may not rank as high under the drier conditions normally encountered on recrop. Similarly, the late maturing soft white wheats ranked high in these high moisture recrop trials (Tables 1 & 2), but have yielded poorly in other trials under drier conditions.

Table 1. **Dryland Recrop No-till Spring Wheat** variety trial grown north of **Conrad,** 1993. Mont. Agr. Expt. Station. Western Triangle Ag. Research Center, Conrad, Montana.

Variety		Yield bu/ac	Test wt. lbs/bu.	Head date	% protein
PENAWAWA	(s. white)	54.4	57.3	197	5.8
WESTBRED 926		46.9	56.8	190	9.5
MT 8849		44.7	58.1	196	9.7
OWENS	(s. white)	43.7	51.9	195	8.5
AMIDON	*	43.2	57.2	197	10.7
RAMBO	*	41.8	50.9	201	9.4
GLENMAN	*	40.4	56.2	198	9.0
PONDERA		38.8	59.7	194	11.0
STOA		38.4	58.1	199	9.9
GUS		38.0	58.0	197	10.0
HI-LINE		37.7	60.7	195	9.4
FORTUNA	*	37.5	60.2	194	9.7
KLASIC	(h. white)	36.3	59.3	188	9.4
LEW	*	36.1	59.4	201	9.4
NEWANA		36.1	57.7	199	9.6
GRANDIN		36.1	58.6	195	10.2
LEN		35.3	56.9	195	12.6
OLAF		35.2	56.5	198	12.8
CUTLESS	*	33.1	58.8	197	11.5
LANCER	*	32.1	59.6	197	10.8

Cooperator: Western Triangle Ag. Research Center.
Location: Ten miles north of Conrad, MT. (Pondera County)
Fertilizer: 100# 11-52-0 with the seed, + 60# N topdressed.
Previous crop: Barley.
Date seeded: May 12, 1993.
Date harvested: Sept. 22, 1993.
Rainfall: From May 13 to harvest was 12.87 inches.
Soil probe depth at seeding: 39 inches.
* = Sawfly resistant varieties. (Amidon and Rambo have partial resistance.)
Yield experimental mean: 39.29
Error degrees of freedom: 38.00
F test for var: 2.92
C.V. 2: 7.87
LSD (0.05): 8.85

Table 2. **Four-year** summary for **Recrop Spring Wheat** varieties grown near **Conrad, MT.** 1989 - 1990 - 1991 - 1993. Mont. Agr. Expt. Station, Western Triangle Agr. Research Center, Conrad, MT.

Variety		4 - year comparable average				
		Yield bu/ac	Test wt lbs/bu	Plant hgt. @ inches	Head date	% Protein
PENAWAWA	(s. white)	50.8	60.7	28.7	190	8.5
WESTBRED 926		46.4	60.7	29.6	186	10.5
OWENS	(s. white)	45.7	58.3	30.0	189	9.5
RAMBO	*	43.8	59.3	30.4	193	11.3
GLENMAN	*	43.7	60.0	30.9	190	10.5
HI-LINE		42.7	62.8	30.1	189	11.0
STOA		42.3	61.1	36.3	189	11.9
AMIDON	*	42.3	61.1	35.7	189	11.4
PONDERA		41.8	62.3	30.0	188	11.8
FORTUNA	*	41.8	62.1	36.3	189	11.7
GUS		41.5	61.6	30.9	190	12.0
NEWANA		41.4	61.0	28.6	192	10.8
LEN		41.2	60.6	29.7	187	11.6
LEW	*	41.0	62.3	36.0	192	11.1
KLASIC		40.4	63.2	22.1	181	10.5
GRANDIN	(h. white)	40.2	61.8	31.7	187	10.9
OLAF		40.2	60.4	31.3	190	12.2
CUTLESS	*	38.5	61.0	33.5	190	12.2
LANCER	*	38.4	62.2	37.4	191	11.8

Cooperator: Western Triangle Agricultural Research Center.
Location: Ten miles north of Conrad, MT. (Pondera County)
* = Sawfly resistant varieties. (Amidon and Rambo have partial resistance.)
@ = Plant height averages based on three years only. (89-90-91)

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Table 3. **Dryland Recrop No-till Barley** variety trial grown north of **Conrad,** 1993. Mont. Agr. Expt. Station, Western Triangle Ag. Research Center, Conrad, MT.

Variety	Yield bu/ac	Test wt lbs/bu	% Plump	% Thin	Head date	% Protein
Baronesse	72.4	51.6	90	3	198	7.7
MT 890008	62.7	50.5	90	3	199	7.5
MT 860756	60.6	51.4	91	3	197	7.6
MT 851195	59.9	51.2	88	3	197	7.7
Piroline	58.1	53.5	91	2	195	7.7
Gallatin	56.8	52.3	92	3	196	8.0
Hector	55.9	51.3	73	5	198	8.3
MT 851032	55.2	50.8	88	3	200	7.6
Harrington	54.0	49.7	91	2	200	7.7
MT 81161	53.9	50.2	93	2	194	8.4
Lewis	53.6	52.2	90	3	196	7.6
Clark	53.1	49.4	64	12	198	7.9
Steptoe	52.8	44.1	77	9	188	8.3
Bearpaw	49.9	50.0	86	3	198	7.6
Bowman	49.2	51.8	95	2	190	8.8
MT 140523	48.5	50.4	82	5	195	7.8
Colter	41.5	45.6	71	10	191	8.2
Stark	35.8	52.3	95	2	191	8.3

Cooperator: Western Triangle Ag. Research Center.
Location: Ten miles north of Conrad, MT. (Pondera County)
Fertilizer: 100# 11-51-0 with the seed, + 60# N actual topdressed before planting.
Previous crop: Barley.
Method of seeding: Double-disc drill.
Date seeded: May 12, 1993.
Date harvested: Sept. 2, 1993.
Soil probe depth at seeding: 3 feet 3 inches.
Rainfall: From seeding to harvest was 9.1 inches.
Yield experimental mean: 54.10
Error degrees of freedom: 34
F test for var. = 5.53, C.V. 2 = 6.27, LSD (0.05) = 9.75

Table 4. **Four-year** summary for **Recrop Dryland No-Till Barley** varieties grown north of **Conrad,** MT. 1989 - 1990 - 1991 - 1993. Mont. Agr. Expt. Station, Western Triangle Agr. Research Center, Conrad, MT.

	4 - year comparable average						
Variety	Yield bu\ac	Test weight lbs\bu	Plant hgt.* inches	% Plump	% thin	Head date	% Protein
BARONESSE	78.1	52.7	28.5	85.9	3.2	193	7.9
GALLATIN	66.8	53.2	30.3	86.0	4.3	190	8.8
HECTOR	66.6	52.4	30.0	81.0	5.8	191	8.9
MT 140523	65.9	52.2	29.3	86.5	3.8	191	9.0
LEWIS	65.2	53.4	29.3	86.0	4.3	192	9.1
STEPTOE	64.9	46.7	28.7	85.8	5.8	185	8.3
PIROLINE	64.3	54.5	31.7	92.0	2.5	189	8.8
MT 81161	64.0	51.5	29.5	92.3	1.7	189	9.2
HARRINGTON	62.3	51.3	30.0	88.5	3.3	193	8.6
CLARK	61.3	50.6	31.7	70.3	9.8	192	9.2
BEARPAW	60.7	50.6	29.3	83.5	4.0	194	8.6
BOWMAN	60.2	52.7	29.6	95.5	2.0	186	10.1
STARK	56.0	53.8	30.2	94.8	2.2	187	9.2

Cooperator: Western Triangle Ag. Research Center.
Location: Ten miles north of Conrad, MT. (Pondera County)
* = Plant height averages based on three years only. (89-90-91)