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

Year: 1991

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 1990, fallow in 1989, and barley in 1988. 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 April 23, 1991. Growing season rainfall 12.13 inches from planting to ripening.

Results: Growing season rainfall has been unusually high during the last three years (1989-1991) at this location, contributing to higher than expected yields for recrop. (Moisture during 1988 was insufficient to support plant growth beyond the seedling stage). In spite of the high moisture, disease levels were very low.

No-till recrop data for spring wheat and barley for 1991 are presented in Tables 1 and 3, respectively; with three-year averages in Tables 2 and 4. Over the three-year period, Westbred 926R, Hi-Line, Glenman, and Rambo ranked highest for yield on recrop at Conrad. These three varieties also were among the top yielders in fallow trials. Fortuna and Stoa ranked fairly high on recrop, but averaged low in fallow trials. Although test weights of all varieties averaged at least 60 pounds, Glenman in some years has shown inferior test weight. The barley varieties Hector, Gallatin, and Lewis were among the highest yielders on both recrop and fallow conditions. The variety Baronesse was tested only in 1991, and was the highest yielder. However, this variety had fairly late maturity (similar to Harrington), and may not rank as high under the drier conditions normally encountered on recrop. Net blotch on barley was more prevalent in recrop than fallow, but the levels were less than moderate in most years.

Table 1. Dryland **Recrop Spring Wheat** variety trial grown north of Conrad, 1991. Mont. Agr. Expt. Sta., Western Triangle Ag. Research Center, Conrad, MT.

Variety		Yield bu/ac	Test wt. lbs/bu.	Plant hgt. inches	Head date	% Protein
PENAWAWA	(s. white)	56.27	62.23	30	185	7.6
OWENS	(s. white)	55.76	60.25	33	184	8.6
NEWANA		52.73	62.58	32	186	9.3
GLENMAN	*	51.44	61.38	35	184	9.5
PONDERA		50.62	63.92	33	182	10.5
FORTUNA	*	50.19	63.42	41	184	10.3
WESTBRED 926		50.15	62.58	30	179	9.7
LEW	*	49.41	63.78	39	187	9.9
GUS		47.48	63.28	34	184	11.2
STOA		47.19	62.65	41	183	10.7
GRANDIN		46.78	62.65	35	182	10.9
RAMBO	*	46.53	61.80	32	187	10.4
LEN		44.76	62.79	32	180	10.0
HI-LINE	(MT 8402)	44.50	64.34	31	182	9.8
CUTLESS	*	44.30	63.85	37	185	10.2
AMIDON	*	43.24	62.79	38	184	9.9
OLAF		43.01	61.87	34	184	10.2
LANCER	*	41.93	63.57	40	186	10.0

Location : Research Center, Conrad
Fertilizer : 100# 11-51-0 with the seed, + 70# N actual topdressed.
Previous crop : Fallow
Date seeded : April 23, 1991.
Date harvested : August 20, 1991.
Rainfall : From seeding to harvest, 12.13 inches.
Soil moisture probe depth at seeding : 3'6" +
* = Sawfly resistant varieties. (Amidon and Rambo partial resistance)
Yield experimental mean : 48.13
Error degrees of freedom : 34.00
F test for var. : 2.01
C.V. 2 : 6.22
LSD (0.05) : 8.60

Table 2. **Three-year** summary for **Recrop Spring Wheat** varieties grown north of Conrad, MT. 1989 - 1990 - 1991. Mont. Agr. Expt. Station, Western Triangle Ag. Research Center, Conrad, MT.

Variety		3 - year comparable average			
		Yield Bu\ac	Test wt. lbs\bu.	Plant hgt. inches	% Protein
PENAWAWA	(s. white)	49.6	62	29	9.5
OWENS	(s. white)	46.3	60	30	9.9
WESTBRED 926		44.8	62	30	10.9
GLENMAN	*	44.6	62	31	11.1
RAMBO	*	44.6	62	30	11.9
HI-LINE	(MT 8402)	44.3	63	30	11.5
FORTUNA	*	43.3	63	36	12.4
STOA		43.3	62	36	12.6
LEN		43.3	62	30	11.3
NEWANA		43.0	62	30	11.2
LEW	*	42.6	63	36	11.5
PONDERA		42.6	63	30	12.1
GUS		42.1	63	31	12.8
AMIDON	*	42.0	63	36	11.7
OLAF		41.6	62	31	11.9
GRANDIN		41.6	62	32	12.0
LANCER	*	40.6	63	37	12.1
CUTLESS	*	39.9	61	34	12.4

Location : Western Triangle Ag. Research Center, ten miles north of Conrad, Pondera County.
Planting method : Seeded into standing stubble with a double disc drill.
* = Sawfly resistant varieties. (Rambo and Amidon have partial resistance.)

Table 3. Dryland **Recrop No-till Barley** grown north of **Conrad**, 1991. Mont. Agr. Expt. Sta., Western Triangel Ag. Research Center, Conrad, MT.

Variety	Yield bu/ac	Test wt. lbs/bu.	Plant hgt. inches	Head date	% Plump	% Thin	% Protein
Baronesse	80.66	52.34	31	185	78	4	
Steptoe	80.24	46.49	32	179	91	4	
Stark (ND 9866)	74.77	54.03	34	180	93	2	
MT 140523	74.66	51.92	34	183	85	4	
Gallatin	74.37	53.54	36	182	77	7	
Harrington	71.16	50.58	34	185	85	4	
Piroline	71.14	54.17	38	182	88	4	
Lewis	71.00	53.82	33	184	79	7	
Hector	70.56	51.00	35	184	72	10	
Clark	69.29	51.49	37	184	75	9	
Excel	68.21	47.68	34	180	65	11	
Bowman	65.96	53.19	34	178	97	1	
Bearpaw	64.06	49.31	35	186	80	4	
Shonkin	63.52	57.00	37	185	67	7	

Location : Research center, Conrad.
Fertilizer : 100# 11-51-0 with the seed + 70# N actual topdressed.
Previous crop : Barley
Seeded into standing stubble with a double disc drill.
Preplant weed control : Stubble sprayed with Roundup herbicide.
Date seeded : April 23, 1991.
Date harvested : August 12, 1991.
Rainfall : From seeding to harvest : 12.13 inches.
Soil moisture probe depth at seeding : 3'6" +
Yield experimental mean : 71.40
Error degrees of freedom : 26
F test for var. : 2.09
C.V. 2 : 5.07
LSD (0.05) : 10.53

Table 4. **Three-year** summary for dryland **No-till Recrop Barley** varieties grown north of **Conrad,** MT. 1989 - 1990 - 1991. Mont. Agr. Expt. Station, Western Triangle Ag. Research Center, Conrad, MT.

Variety	3 - year comparable average						
	Yield bu/ac	Test wt. lbs/bu.	Plant hgt. inches	Head Date	% Plump	% Thin	% Protein 1/
MT 140523	71.7	53	30	189	88	3	10.2
HECTOR	70.7	53	30	189	84	6	9.6
GALLATIN	70.0	54	30	187	84	5	9.6
LEWIS	69.0	54	30	191	85	5	10.4
STEPTOE	68.7	48	29	183	89	5	8.4
PIROLINE	66.3	55	32	187	92	3	9.8
STARK (ND 9866)	65.7	54	31	185	92	2	9.8
HARRINGTON	65.0	52	32	191	88	4	9.6
BEARPAW	64.3	51	29	192	83	4	9.8
BOWMAN	64.0	53	30	185	96	2	10.9
CLARK	64.0	51	29	190	72	9	10.5

Location : Research Center ten miles north of Conrad, Pondera County.

1/ = Proteins based on two years average. (1989-1990)