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PROJECT TITLE: Evaluate spring cereal grain variety performance under standard cropping methods at Denton, Highwood, and Winifred.

PROJECT LEADER: David M. Wichman, Agronomist - Moccasin

PROJECT PERSONNEL: T.L. Blake, Barley Breeder, Bozeman
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Objectives:
To evaluate the performance of spring cereal grain varieties in environments and cropping methods unlike those at the Central Agricultural Research Center.

RESULTS:
All nurseries were on recrop. Spring grain yields were near average at Denton, below average at Winifred, and less than half of the long term average at Highwood. The low yields were combination of spring drought and Russian aphid damage. Due to the drought conditions many producers chose not to treat for Russian aphids.

BARLEY: Gallatin and Hector had the high average yields across the three locations. Other varieties with high average yields were Baronesse, MT81161, Steptoe, and Bearpaw.

SPRING WHEAT: Penawawa, a soft white, had the high average yield across the three off-station locations. It has been one of the top yielders in our off-station trials for a number of years. Lew, MT 8849, and Glenman followed Penawawa in average yield for the three locations.

SUMMARY:
The 1992 spring cereal grain trials provide information on how stable the various varieties are under stressful conditions. They do not tell us much about the potential of the varieties under ideal conditions. The multiple year summaries provide a more accurate demonstration of the yield potential of a variety.

FUTURE PLANS:
We attempt to stay at a location for eight consecutive years. We have been at Denton (6), Highwood (4), and Winifred (1) years. At present we plan to continue the trials at these three locations. Due to continued budget constraints and uncertainty, future plans are not certain.

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Table 1 1992 Denton Off-Station Spring Barley Trial
Exp.3657 Central Agricultural Research Center, Moccasin, MT.

VARIETY	Plant Ht	Grain Yield	Grain TestWt	Grain Protein	Plump >6/64	Thin <5.5/64
	"	bu/ac	lb/bu	%	%	%
Hector	25	45.5	50.3	----	78	7
Steptoe	18	40.3	48.0	11.6	93	1
Gallatin	24	38.7	51.7	11.4	78	6
Bearpaw	23	37.5	47.5	11.8	74	8
Bowman	23	37.5	50.4	13.2	89	2
Piroline	22	37.5	50.5	11.6	73	6
Harrington	24	37.2	49.5	11.8	78	8
Baronesse	24	36.9	49.4	11.3	78	8
Stark	24	36.3	51.8	12.3	90	3
Excel	19	36.1	50.6	11.0	88	2
MT81161	23	35.7	47.9	11.3	75	8
Clark	24	35.6	48.5	12.5	76	9
MT860756	23	34.9	49.0	11.3	85	5
Lewis	23	33.2	50.7	12.5	79	6
MT140523	23	30.1	48.4	11.6	52	17
EXPERIMENTAL MEANS		36.83	49.61			
F TEST FOR VAR. df=28		3.67	10.83			
C.V. 1: (S/MEAN)*100		8.36	1.45			
C.V. 2: (S OF MEAN/MEAN)*100		4.83	.84			
LSD (0.05)		5.15	1.21			

Planted: 4-15-92
Previous Crop: Field peas.
Harvested: 8-11-92
Fertility: Preplant anhydrous units N. 50 lbs/ac of 18-46-0 with seed.
Soil test: NO3-N = 14 lbs/ac. Olsen P = 17 ppm.
Growing season precipitation:
Cooperator: D. Wichman, J. Vavrovsky, T. Blake, P. Hensleigh.
Producer: Richard Barber.

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

VARIETY	1987	1988	1989	1990	1991	1992 @	AVE.	HECTOR SAME YRS.
	- - - - - - - - - - bu/a - - - - - - - - - -							
HECTOR	40.1	35.4	68.0	38.3	68.1	45.5	49.2	----
PIROLINE	46.7	33.8	72.8	43.2	63.4	37.5	49.6	49.2
HARRINGTON	56.4	27.9	52.8	37.4	58.6	37.2	45.0	49.2
CLARK	59.7	33.8	52.0	38.2	60.7	35.6	46.7	49.2
LEWIS	65.7	23.8	59.3	46.5	68.5	33.2	49.5	49.2
BOWMAN	53.2	26.4	55.7	42.4	51.2*	37.5	44.4	49.2
STEPTOE	62.0	28.6	74.0	44.2	67.5	40.3	52.8	49.2
GALLATIN	67.0	35.5	59.1	42.3	65.2	38.7	51.3	49.2
BEARPAW	72.7	34.5	58.9	39.0	67.8	37.5	51.7	49.2
MT 81161	70.4	33.1	68.5			35.7		
MT 140523		32.5	61.5	40.9	71.9	30.1		
STARK				49.1	70.4	36.3		
BARONESSE					71.4	36.9		
EXCEL					69.7	36.1		
Mean	57.3	31.1	62.0	40.8	65.2	36.8		

*Bowman suffered unidentified insect damage in 1991. Stark also showed some damage in one rep.
@Planted recrop on field pea ground. All other years on fallow. Variety trials were located on Richard Barber farm.

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Table 3 1992 Highwood Recrop Spring Barley Trial
Exp.3658 Central Agricultural Research Center, Moccasin, MT.

VARIETY	Plant Ht	Grain Yield	Grain TestWt	Grain Protein	Plump >6/64	Thin <5.5/64
	"	bu/ac	lb/bu	%	%	%
Gallatin	22	28.3	48.1		90	2
MT860756	22	26.9	46.0		89	4
Steptoe	15	25.6	41.7		92	2
MT81161	18	25.5	45.0		85	4
Clark	21	25.5	44.4		83	4
Bearpaw	20	24.9	44.0		82	6
Baronesse	16	24.3	45.8		85	5
Piroline	17	22.4	48.3		84	3
Hector	19	21.5	45.4		83	5
Harrington	19	21.0	45.4		85	6
Bowman	19	20.4	46.5		89	3
MT140523	19	20.2	44.8		79	5
Lewis	20	19.1	45.4		85	4
Stark	23	18.7	47.3		92	3
Excel	20	13.8	45.0		92	2
EXPERIMENTAL MEANS		22.54				
F TEST FOR VAR. df=14		3.05				
C.V. 1: (S/MEAN)*100		13.72				
C.V. 2: (S OF MEAN/MEAN)*10		9.70				
LSD (0.05)		6.63				

Planted: 4-16-92
Previous Crop: Winter Wheat
Harvested: 8-31-92
Fertility:
Soil Test: NO3-N = 34 lbs/ac. Olsen P = 45 ppm.
Growing season precipitation:
Cooperator: D. Wichman, J. Vavrovsky, T. Blake, P. Hensleigh.
Producer: Ron Long, Shonkin

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

VARIETY	1990	1991	1992	AVG.	HECTOR SAME YRS.
	----------bu/a----------				
HECTOR	64.7	42.0	21.5	42.7	----
PIROLINE	64.3	38.9	22.4	41.9	42.7
HARRINGTON	68.3	35.8	21.0	41.7	42.7
CLARK	59.3	30.9	25.5	38.6	42.7
LEWIS	55.0	43.5	19.1	39.2	42.7
BOWMAN	56.7	41.2	20.4	39.4	42.7
STEPTOE	43.4	51.8	25.6	40.3	42.7
GALLATIN	61.7	39.5	28.3	43.2	42.7
BEARPAW	62.1	40.1	24.9	42.4	42.7
MT 81161			25.5		
MT 140523	58.2	38.2	20.2	38.9	42.7
STARK	54.8	37.7	18.7	37.1	42.7
BARONESSE		40.8	24.3		
EXCEL		39.8	13.8		
Mean	58.8	39.9	22.5		

Variety trials were located at Ron Long farm.
The 1989 trial was hailed out.
All trials were planted on recrop ground.

Table 5 1992 Winifred Recrop Spring Barley Trial
Exp.3660 Central Agricultural Research Center, Moccasin, MT.

VARIETY	Plant Ht	Grain Yield	Grain TestWt	Grain Protein	Plump >6/64	Thin <5.5/64
	"	bu/ac	lb/bu	%	%	%
Gallatin	18	42.5	48.9		77	6
MT81161	17	40.2	45.1		74	8
Baronesse	16	39.7	46.6		67	12
Bearpaw	17	37.9	45.3		63	11
Harrington	16	37.2	45.4		61	11
Lewis	19	37.0	47.5		72	9
Hector	19	36.3	47.9		70	9
Clark	17	35.4	45.7		63	14
Steptoe	18	35.4	42.3		85	11
MT140523	18	35.3	46.2		62	14
Bowman	18	34.8	47.7		82	5
Piroline	17	34.6	48.8		63	9
MT860756	17	34.0	47.0		69	12
Excel	18	31.8	45.0		74	10
Stark	19	31.8	48.9		80	6
EXPERIMENTAL MEANS		36.25	46.57			
F TEST FOR VAR. df=28		1.98	35.84			
C.V. 1: (S/MEAN)*100		10.05	1.13			
C.V. 2: (S MN/MN)*100		5.80	.65			
LSD (0.05)		6.09	.88			

Planted: 4-7-92
Previous Crop: Winter Wheat
Harvested: 9-1-92
Fertility:
Soil Test: NO3-N = 14 lbs/ac. Olsen P = 24 ppm.
Moisture Probe Depth: 14 inches.
Soil Temp.: 3 degrees C at 2" depth.
Growing season precipitation:
Cooperator: D. Wichman, J. Vavrovsky, T. Blake, P. Hensleigh.
Producer: Bruce Udelhoven

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Table 6 1992 Denton Spring Wheat Variety Performance Trial
Exp.9906 Central Agricultural Research Center, Moccasin, MT

Variety	Plant Height	Grain Yield	Grain TestWt	Grain Protein
	"	bu/a	lbs/bu	%
PENAWAWA	23	34.0	61.8	12.9
OWENS	24	29.0	61.2	13.9
LEW	26	27.5	61.4	13.5
MT 8849	25	26.7	60.3	14.3
GLENMAN	24	26.6	59.8	13.8
HI-LINE	27	26.3	61.0	15.9
RAMBO	23	25.5	61.4	15.7
PONDERA	24	25.3	61.2	16.2
NEWANA	26	25.2	61.5	15.4
GRANDIN	28	25.1	62.8	14.9
STOA	26	24.7	59.1	14.8
LANCER	28	22.9	60.4	15.6
AMIDON	25	22.7	60.9	15.5
KLASIC	18	21.7	62.1	16.7
LEN	24	21.0	61.5	15.7
OLAF	24	19.6	60.2	16.4
WESTBRED 926	24	18.9	60.6	16.1
GUS	22	18.9	59.2	17.1
CUTLESS	23	17.7	60.1	16.7
FORTUNA	27	16.8	59.9	17.9
EXPERIMENTAL MEANS		23.81	60.82	
F TEST FOR VAR. df=38		9.40	8.92	
C.V. 1: (S/MEAN)*100		10.07	.91	
C.V. 2: (S OF MEAN/MEAN)*100		5.81	.52	
LSD (0.05)		3.96	.91	

Planted: 4-15-92
Harvested: 8-11-92
Fertility: Preplant anhydrous units N. 50 lbs/ac of 18-46-0 with seed.
Soil Test: NO3-N = 14 lbs/ac. Olsen P = 17 ppm.
Growing season precipitation:
Cooperator: D. Wichman, J. Vavrovsky, L. Talbert, S. Lanning.
Producer: Richard Barber.

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Table 7 Denton Off-Station Spring Wheat Multi-Year Summary
Central Agricultural Research Center, Moccasin, MT.

VARIETY	1987	1988	1989	1990	1991	1992 *	AVG.	NEWANA SAME YRS
	bu/a							
ALEX	37.5	22.4	41.2	28.6			32.4	33.9
OLAF		22.2	43.0	27.4	50.2	19.6	32.5	36.2
AMIDON			47.6	26.0	60.0	22.7	39.1	38.8
PENAWAWA			44.1	25.9	63.3	34.0	41.8	38.8
LEN	37.0	24.7	40.3	25.9	52.5	21.0	33.6	37.7
OWENS	39.2	26.2	45.8	25.6	61.9	29.0	37.9	37.7
STOA		22.9	40.3	25.1	56.9	24.7	34.0	36.2
WESTBRED 906R	37.6	21.8	38.5	24.6			30.6	33.9
GLENMAN		24.3	38.5	23.9	51.3	26.6	32.9	36.2
WESTBRED 926R				23.6	61.2	18.9	34.6	37.2
GRANDIN				23.3	60.0	25.1	36.1	37.2
LANCER	33.2	23.2	36.0	23.0		22.9	27.7	32.2
FORTUNA	37.1	16.8	37.9	22.8	61.6	16.8	32.2	37.7
RAMBO	44.3	23.6	41.7	22.3	49.5	25.5	34.5	37.7
LEW	33.9	21.7	40.0	22.0	50.5	27.5	32.6	37.7
PONDERA	39.8	22.9	39.7	21.6	58.1	25.3	34.6	37.7
GUS				21.5	53.9	18.9	31.4	37.2
NEWANA	44.9	26.0	43.5	21.2	65.3	25.2	37.7	----
CUTLESS	30.4	20.4	35.7	20.4	46.8	17.7	28.6	37.7
HI-LINE			41.3	17.5	59.0	26.3	36.0	38.8
Mean	39.1	23.5	41.1	23.6	56.6	23.8		

*Planted recrop on field pea ground.
Variety trials were located on Richard Barber farm.
The 1988 trial suffered some sawfly damage.

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Table 8 1992 Highwood Spring Wheat Variety Performance Trial
Exp.9908 Central Agricultural Research Center, Moccasin, MT.

Variety	Sawfly Damage [1]	Plant Height	Grain Yield	Grain TestWt	Grain Protein
		"	bu/a	lbs/bu	%
LEW	0	25	23.0	58.8	
PENAWAWA	2	20	21.2	58.3	
GLENMAN	0	23	19.5	57.0	
MT 8849	2	25	17.8	57.5	
LANCER	0	27	17.2	57.6	
RAMBO	0	21	15.2	58.1	
AMIDON	2	21	14.6	57.9	
NEWANA	3	21	14.0	58.5	
PONDERA	2	22	13.8	59.3	
CUTLESS	0	21	13.8	57.2	
OWENS	2	21	13.0	57.8	
FORTUNA	0	25	12.0	58.0	
STOA	3	24	11.7	58.6	
HI-LINE	2	20	11.7	59.2	
GUS	3	20	11.7	55.8	
LEN	2	21	11.6	58.3	
OLAF	2	22	10.9	58.1	
WESTBRED 926	1	17	10.8	58.8	
GRANDIN	3	24	10.5	60.6	
KLASIC	0	12	9.4	58.9	
EXPERIMENTAL MEANS			14.18		
F TEST FOR VAR. df=38			18.28		
C.V. 1: (S/MEAN)*100			10.75		
C.V. 2: (S OF MEAN/MEAN)*100			6.21		
LSD (0.05)			2.52		

[1] Sawfly damage scale (0-10) 0=no damage
Samples were too small to run test weights on all reps.
Planted: 4-16-92 on tilled winter wheat stubble.
Harvested: 8-31-92
Fertility: 50lbs 18-46-0 w/seed, 90 N broadcast
Soil Test: NO3-N = 34 lbs/ac. Olsen P = 45 ppm.
Growing season precipitation:
Cooperator: D. Wichman, J. Vavrovsky, L. Talbert, S. Lanning.
Producer: Ron Long, Shonkin.

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Table 9 Highwood Off-Station Spring Wheat Multi-Year Summary
Central Agricultural Research Center, Moccasin, MT.

VARIETY	1990	1991	1992	AVG.	NEWANA SAME YRS.
	bu/a				
ALEX	35.7			35.7	34.8
OLAF	38.2	29.9	10.9	26.3	25.9
AMIDON	44.7	25.3	14.6	28.2	25.9
PENAWAWA	48.2	26.8	21.2	32.1	25.9
LEN	36.8	25.5	11.6	24.6	25.9
OWENS	38.5	27.3	13.0	26.3	25.9
STOA	37.9	34.2	11.7	27.9	25.9
WESTBRED 906R	39.3			39.3	34.8
GLENMAN	38.9	29.7	19.5	29.4	25.9
WESTBRED 926R	43.7	30.8	10.8	28.4	25.9
GRANDIN	40.8	28.9	10.5	26.7	25.9
LANCER	36.0		17.2	26.6	24.4
FORTUNA	36.5	33.1	12.0	27.2	25.9
RAMBO	35.5	26.8	15.2	25.8	25.9
LEW	39.6	24.2	23.0	28.9	25.9
PONDERA	41.0	22.1	13.8	25.6	25.9
GUS	37.2	33.1	11.7	27.3	25.9
NEWANA	34.8*	29.0	14.0	25.9	25.9
CUTLESS	35.5	31.4	13.8	26.9	25.9
HI-LINE	40.3	21.9	11.7	24.6	25.9
Mean	38.9	28.2	14.2		

*Probable mixup of seed sources, interpret Newana rank with caution.
Variety trials were located at Ron Long farm .
The 1989 trial was hailed out.

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Table 10 1992 Winifred Spring Wheat Variety Performance Trial
Exp.9909 Central Agricultural Research Center, Moccasin, MT.

Variety	Plant Height	Grain		
		Yield	TestWt	Protein
	"	bu/ac	lb/bu	%
MT 8849	22	27.3	57.3	
PENAWAWA	21	23.3	57.5	
RAMBO	23	23.1	58.6	
AMIDON	25	22.7	57.3	
LEW	25	22.3	57.0	
STOA	26	21.1	55.8	
LEN	23	21.0	58.2	
NEWANA	20	20.8	58.5	
GUS	19	20.4	56.6	
GRANDIN	22	20.2	58.5	
GLENMAN	23	20.1	55.8	
LANCER	22	19.9	57.4	
OWENS	21	19.8	56.8	
PONDERA	19	19.5	58.9	
WESTBRED 926	18	17.7	56.9	
HI-LINE	19	17.2	58.6	
CUTLESS	22	16.8	55.2	
OLAF	22	16.4	59.8	
FORTUNA	24	15.9	55.3	
KLASIC	14	14.1	57.9	
EXPERIMENTAL MEANS		19.98		
F TEST FOR VAR. df=38		9.30		
C.V. 1: (S/MEAN)*100		8.65		
C.V. 2: (S OF MEAN/MEAN)*100		4.99		
LSD (0.05)		2.86		

Planted: 4-7-92 on recrop winter wheat ground.
Soil Temp.: 3 degrees C.
Moisture probe depth: 14"
Harvested: 9-1-92
Fertility:
Soil Test: NO3-N = 14 lbs/ac. Olsen P = 24 ppm.
Growing season precipitation:
Cooperator: D. Wichman, J. Vavrovsky, L. Talbert, S. Lanning.
Producer: Bruce Udelhoven, Winifred