

PROJECT TITLE: Evaluation of spring barley variety performance in off-station trials near Denton and Fort Benton.

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OBJECTIVES:
To evaluate the performance of spring barley varieties in environments and cropping methods representative of the southern triangle and central Montana.

RESULTS:
Denton yields ranged from 34 to 45 bu/a with the average equal to 39 bu/a. Three of the four top yielding varieties/lines were Baronesse and two experimental MTLB crosses. Baronesse has the highest long-term (eight years) yield average at 61 bu/a. All varieties were below their long-term averages. The average test weight was 43 lbs/bu, well below average. Proteins were above average, while the percentage of plump kernels was below average. The current year's data and multi-year summary are presented in Tables 1 and 2.

Fort Benton yields ranged from 23 to 35 bu/a with the average equal to 31 bu/a. Bowman, Baronesse and Stark were the top yielding varieties at 35, 34 and 34 bu/a, respectively. Bowman has the highest long-term (nine years) yield average at 35 bu/a. All varieties were well below their long-term averages this year. Test weights were below normal, averaging 42 lbs/bu. Proteins were slightly above average, while the percentage of plump kernels was well below normal. The current year's data and multi-year summary are presented in Tables 3 and 4.

SUMMARY:
One objective of the Lewis by Baronesse crosses was to combine the malting characteristics of Lewis with the yielding potential of Baronesse, and come up with something better than either parental line. Experimental MTLB lines performed well at both locations, considering the crops year weather conditions. Both Denton and Fort Benton had below normal yields and test weights. Stand establishment was erratic at both locations due to droughty conditions experienced after seeding. In addition, hot, dry, windy conditions during heading and grain-fill depressed yields and test weights.

FUTURE PLANS:
Spring barley variety evaluations will continue at Denton and Fort Benton.

Table 1. 1998 Denton Off-Station Barley Variety Trial – Exp. 3671. Central Agricultural Research Center. Moccasin, MT.

Id	Variety/Line	Grain Yield (bu/a)	Test Weight (lbs/bu)	Plant Height (in.)	Protein Content %	Plump ^{1/} %	Thin ^{2/} %
MT920073	MT920073	45.3	42.2	26	16.3	21	40
MTLB 5	MTLB 5	41.4	41.7	24	16.7	5	65
PI568246	Baronesse	40.7	39.8	24	15.0	8	58
MTLB 6	MTLB 6	40.7	43.3	26	16.5	21	44
PI591823	Chinook	40.5	42.2	28	15.5	17	51
MT910189	MT910189	39.9	43.8	25	13.9	32	33
SK 76333	Harrington	39.8	40.2	27	15.3	28	33
ND 9866	Stark	39.8	46.1	26	14.9	41	27
N1123111	Logan	39.8	43.8	24	15.4	28	39
CI 15514	Hector	39.6	43.6	26	16.6	21	48
MT910150	MT910150	38.6	42.8	27	16.4	24	40
MTLB 32	MTLB 32	38.5	42.6	22	15.6	12	53
PI491534	Gallatin	38.4	43.6	28	15.6	13	45
PI483237	Bowman	36.9	45.9	24	15.6	50	18
MTLB 57	MTLB 57	36.2	41.7	25	15.1	11	56
CI 15856	Lewis	33.6	43.7	27	16.7	22	45
Experimental Means		39.3	42.9	25.6	15.7	22.1	43.4
F-Value for Var. (df = 15)		0.7ns	5.6**	-	-	5.1**	6.6**
CV 1: (S/Mean)*100		10.7	2.4	-	-	33.6	15.3
LSD (0.05)		8.9	2.2	-	-	15.8	14.1

* Note: This year's nursery experienced uneven germination, severely in one of the reps, therefore only two were harvested.

1/ Plump > 6/64

2/ Thin < 5.5/64

** Denotes Statistical Significance at P<= 0.01

ns Denotes NO Statistical Significance at P<= 0.05

Planted: 4/23/98

Harvested: 8/10/98

Fertilizer: 60# N

Growing Season Precipitation (May – July): 8.35"

Producer/Cooperator: Richard Barber, Denton

Table 2. Denton Off-Station Barley Multi-Year Yield Summary of Selected Varieties, 1989 – 1998. Central Agricultural Research Center. Moccasin, MT.

Selected Varieties	1989	1990	1991	1992 ^{1/}	1993	1994	1995	1996 ^{1/}	1997 ^{1/}	1998 ^{2/}	Avg.	Hector Same Yrs.
	-----bu/a-----											
Hector	68	38	68	45	90	41	66	32	67	40	55.5	-
Harrington	53	37	59	37	102	33	70	25	68	40	52.4	55.5
Lewis	59	46	68	33	101	41	69	31	79	34	56.1	55.5
Bowman	56	42	51 ^{3/}	37	99	42	67	29	65	37	52.5	55.5
Gallatin	59	42	65	39	100	40	68	31	78	38	56.0	55.5
Chinook	61	41	72	30	106	37	70	30	79	41	56.7	55.5
Stark		49	70	36	105	41	71	32	75	40	57.7	54.1
Baronesse			71	37	121	38	73	31	73	41	60.6	56.1
Nursery Mean	62	41	65	37	104	38	68	30	72	39		
Growing Season Precip. (in.)	10.5	7.6	8.6	6.8	15.6	7.3	12.7	5.4	10.8	11.7		
April Precip. (in.)	2.4	0.8	2.4	1.2	1.2	2.3	2.5	0.7	1.4	0.6		
May Precip. (in.)	2.9	4.2	2.2	1.0	1.9	1.6	3.3	3.3	2.5	3.3		
June Precip. (in.)	3.2	1.5	2.8	2.9	5.4	2.8	3.3	1.4	4.4	3.7		
July Precip. (in.)	1.9	1.0	1.1	1.7	7.0	0.6	3.6	0.1	2.5	4.1		

1/ Trial was planted re-crop on field pea ground in 1992, re-crop following buckwheat in 1996, re-crop following millet in 1997 and all other years on fallow.

2/ Only two reps were harvested in 1998 due to extremely uneven germination in one rep.

3/ Bowman suffered unidentified insect damage in 1991, Stark also showed some damage in one rep.

Table 3. 1998 Fort Benton Off-Station Barley Variety Trial – Exp. 3672. Central Agricultural Research Center. Moccasin, MT.

Id	Variety/Line	Grain Yield (bu/a)	Test Weight (lbs/bu)	Plant Height (in.)	Protein Content %	Plump ^{1/} %	Thin ^{2/} %
PI483237	Bowman	34.5	45.7	26	12.2	54	20
PI568246	Baronesse	34.1	41.4	22	13.4	26	45
ND 9866	Stark	33.6	44.6	25	12.1	40	32
MTLB 5	MTLB 5	32.7	43.1	24	14.9	24	52
MTLB 6	MTLB 6	32.2	41.9	25	15.1	30	49
MTLB 57	MTLB 57	32.2	42.0	22	15.2	26	46
CI 15856	Lewis	31.4	42.5	28	12.9	20	53
MT920073	MT920073	31.2	42.5	24	14.1	40	36
N1123111	Logan	30.9	41.8	23	13.8	22	49
CI 15514	Hector	30.5	41.2	27	12.4	18	59
PI591823	Chinook	29.4	41.9	25	13.7	17	58
MT910150	MT910150	29.2	42.5	23	16.5	30	44
MTLB 32	MTLB 32	28.8	42.1	23	13.8	22	52
PI491534	Gallatin	28.8	43.1	27	12.6	28	43
MT910189	MT910189	27.4	41.4	22	14.0	27	45
SK 76333	Harrington	22.8	39.4	25	13.2	22	47
Experimental Means		30.6	42.3	24.4	13.7	27.8	25.6
F-Value for Var. (df = 15)		1.0ns	1.6ns	-	-	2.3*	2.2*
CV 1: (S/Mean)*100		16.8	4.6	-	-	40.0	25.2
LSD (0.05)		8.6	3.2	-	-	18.5	19.2

1/ Plump > 6/64

2/ Thin < 5.5/64

* Denotes Statistical Significance at P<= 0.05

ns Denotes NO Statistical Significance at P<= 0.05

Planted: 4/23/98 on barley stubble.

Harvested: 8/14/98

Fertilizer: 50# N topdressed.

Growing Season Precipitation (May – July): 5.50"

Producer/Cooperator: Steve Birkeland, Fort Benton

Table 4. Fort Benton Off-Station Spring Barley Multi-Year Yield Summary of Selected Varieties, 1990-1998. Central Agricultural Research Center. Moccasin, MT.

Selected Varieties	1990	1991	1992	1993	1994	1995	1996	1997	1998	Avg.	Hector Same Yrs.
	-----bu/a-----										
Hector	65	42	21	69	65	56	48	74	31	52.3	-
Harrington	68	36	21	68	54	64	51	68	23	50.3	52.3
Lewis	55	43	19	73	61	50	53	77	31	51.3	52.3
Bowman	57	41	20	75	59	59	44	84	35	52.7	52.3
Gallatin	62	39	28	66	63	52	46	67	29	50.2	52.3
Chinook	58	38	20	74	66	67	55	80	29	54.1	52.3
Stark	55	38	19	71	62	51	52	71	34	50.3	52.3
Baronesse		41	24	75	72	73	49	81	34	56.1	50.8
Nursery Mean	58.8	39.9	22.5	71.2	63.0	62.2	49.8	71.3	30.6		
Growing Season											
Precip. (in.)	7.2	11.0	9.3	18.4	4.9	14.9	6.3	8.7	5.5		
April Precip. (in.)	0.9	2.8	1.7	2.3	1.8	1.5	1.5	2.2	na		
May Precip. (in.)	3.4	2.5	1.9	1.9	1.5	4.0	3.0	2.5	na		
June Precip. (in.)	1.7	4.5	2.3	5.5	1.1	7.0	1.3	2.7	na		
July Precip. (in.)	1.3	1.2	3.4	8.7	0.5	2.3	0.6	1.2	na		

All trials were planted on re-crop ground.

1990-1996 the variety trials were located at Ron Long's farm, 1997-1998 trials were located at the Birkleland farm.