PROJECT TITLE: Evaluation of spring barley variety performance in trials near Moccasin, Denton, and Fort Benton.

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OBJECTIVES:
To evaluate the performance of spring barley varieties in recrop environments in the southern triangle and Central Montana.

RESULTS:
Barley variety trials were established on recrop near Moccasin, Denton, and Moore. The Moore site was substituted for the Fort Benton site because of the severe drought conditions that were present at the Fort Benton site when the spring wheat was seeded there. As it turned out, the Moore site experienced severe drought conditions through the spring and early summer.

Yield – 2002 Recrop barley nursery mean yields ranged from 48.4 at CARC down to 17.2 at Moore (Table 1). MT960226 had the three location high mean yield at 37.8 bu/a. Xena had the single location high yield of 54.0 bu/a at Moccasin. Harrington had the lowest mean and lowest single location yield at 31.5 and 10.3 bu/a, respectively. Multi-year yield summaries are presented in tables 3 and 4.

Test Weight – Test weights were above average at an over all mean of 49 lbs/bu (Table 1). The Denton location was slightly below average with a mean of 47.4 lbs/bu. MT070116 had the high mean test weight at 50.0 lbs/bu.

Protein – Grain protein content averaged 17.3% across the three locations. Harrington and MT960100 had the highest three location mean protein content at 18.2% (Table 1). MT970116 had the lowest three location mean protein at 16.5 %. One sample per location was used to determine a variety's protein content.

Heading Date – Heading dates occurred over a seven day period, 01-July through 07-July, at Moccasin. Moccasin was the only location for which heading date was recorded. Haxby and MT070116 were the entries that headed first (Table 2). Several entries headed on 07-July.

Plant Height – Barley variety plant heights ranged from 19 to 25 inches across the three locations (Table 2). MT960228 had the tallest three location mean height at 23.5 inches and MT960100 had the shortest mean plant height at 19.8 inches at Moccasin and from 16 to 22 inches at Fort Benton (Table 2). Lewis and Stark were among the tallest of the varieties grown at either location.

Plump Percent and Thin - were determined for rep 1 samples at all three locations. MT960099 and Lewis had the highest percent thins across the three locations (Table 2). MT970116 had the highest percent plump mean for the three locations at 67.5%.

SUMMARY:
Severe drought and grasshoppers diminished the quality of the Moore site. The Moccasin and Denton locations provide an indication of the potential of barley varieties under marginal plant available water.

FUTURE PLANS:
MAES budget will determine future plans for off-station research at Moccasin, Denton, and Ft Benton.

Table 1 2002 Spring barley yield, test weight, and protein performance in Central Montana
Exp. 3600 Central Agricultural Research Center, Moccasin, MT

ID	Variety	Grain Yield				Test Weight				Grain Protein[1/]			
		Moccasin	Denton	Moore	Average	Moccasin	Denton	Moore	Average	Moccasin	Denton	Moore	Average
		bu/acre	bu/acre	bu/acre	bu/acre	lbs/bu	lbs/bu	lbs/bu	lbs/bu	%	%	%	%
MT960226	MT960226	51.7	43.1	18.7	37.8	53.0	47.7	46.6	49.1	17.9	16.7	17.9	17.5
MT960228	MT960228	53.1	41.8	17.5	37.5	51.7	49.4	48.4	49.8	18.0	16.2	17.3	17.2
BZ594-19	Xena	54.0	41.5	16.6	37.4	52.8	47.9	48.9	49.9	17.1	18.8	16.8	17.5
MT970229	MT970229	47.8	42.9	20.2	37.0	52.2	47.3	49.9	49.8	16.4	15.9	17.1	16.5
MT970116	MT970116	51.7	42.2	16.7	36.9	52.9	48.1	48.9	50.0	17.5	16.1	17.7	17.1
PI568246	Baronesse	49.5	38.5	19.9	36.0	51.5	45.7	47.0	48.0	16.8	18.2	16.9	17.3
MT960100	MT960100	50.6	41.8	15.2	35.9	51.7	47.6	50.4	49.9	18.3	17.7	18.7	18.2
MT960099	MT960099	48.6	39.6	19.0	35.7	51.1	46.3	48.1	48.5	16.9	17.2	17.8	17.3
ND13299	Conlon	48.6	42.1	15.6	35.4	49.4	47.7	45.7	47.6	15.8	17.2	17.4	16.8
PI491534	Gallatin	45.4	38.5	21.5	35.1	51.7	47.1	48.1	49.0	15.7	19.3	17.3	17.4
MT950186	**Haxby**	48.3	36.3	18.3	34.3	51.8	46.9	48.1	48.9	15.5	17.4	17.2	16.7
H3860224	LEWIS/AP	43.0	41.5	18.1	34.2	49.6	48.0	47.9	48.5	15.7	17.9	18	17.2
CI 15856	Lewis	45.8	39.3	17.4	34.2	52.0	48.0	49.0	49.7	16.7	18.5	17.9	17.7
MT960101	MT960101	49.6	37.3	15.1	34.0	51.0	46.8	47.4	48.4	16.9	16.8	18.6	17.4
PI610264	Valier	42.7	40.2	15.1	32.7	51.3	46.6	49.1	49.0	16.8	16.5	19.1	17.4
SK 76333	Harrington	44.0	40.1	10.3	31.5	50.1	47.7	48.3	48.7	16.6	18.2	19.7	18.2
Mean		48.4	40.4	17.2		51.6	47.4	48.2	49.0	16.8	17.4	17.8	
CV (s/mean) %		7.8	16.9	12.5		1.8	4.3	3.1					
LSD (0.05)		6.26	11.40	3.57		1.51	3.40	2.48					

After seeding the spring wheat trial in Ft. Benton, soil was determined to be too dry and barley trial was moved to Moore.

[1/] Protein on dry basis

	Moccasin	*Denton*	*Moore*
Planting Date:	April 15, 2002	April 19, 2002	May 13, 2002
Harvest Date:	August 12, 2002	August 17, 2002	August 18, 2002
Previous Crop:	Canola	Lentils	Barley
Growing Season Precipitation (April-July):	7.49"	8.42"	10.91"
Soil Moisture:	12-16"	9-12"	12"

Table 2 2002 Spring barley heading date, plant height, and grain plumpness in Central Montana
Exp. 3600 Central Agricultural Research Center, Moccasin, MT

ID	Variety	Heading Date	Plant Height				Plump				Thin			
			Mocc	Denton	Moore	Ave	Mocc	Denton	Moore	Ave	Mocc	Denton	Moore	Ave
		day	"	"	"	"	%	%	%	%	%	%	%	%
PI568246	Baronesse	187	21	22	19	20.8	86.4	55.0	42.7	61.4	3.1	4.9	26.4	11.5
ND13299	Conlon	185	22	24	19	21.5	63.3	13.7	38.4	38.5	9.4	7.9	26.5	14.6
PI491534	Gallatin	183	24	22	22	22.7	80.9	42.3	60.6	61.3	5.5	7.2	15.9	9.5
SK 76333	Harrington	185	22	21	20	20.9	83.4	47.0	66.2	65.5	3.7	6.8	10.6	7.0
MT950186	**Haxby**	182	23	24	20	22.1	77.5	38.9	31.0	49.1	4.1	9.7	32.6	15.5
CI 15856	Lewis	183	24	21	20	21.5	78.0	54.2	26.7	53.0	6.0	2.2	40.2	16.1
H3860224	LEWIS/AP	188	22	22	20	21.3	91.5	39.0	61.4	64.0	1.7	3.7	13.0	6.1
MT960099	MT960099	188	21	20	19	19.8	39.9	46.3	21.6	35.9	19.2	1.9	48.3	23.1
MT960100	MT960100	188	22	23	19	21.1	62.9	54.1	38.8	51.9	8.2	5.3	27.4	13.6
MT960101	MT960101	188	21	23	21	21.8	*no data*	40.0	44.5	42.3	*no data*	1.1	22.8	12.0
MT960226	MT960226	182	24	24	21	23.1	89.7	50.0	54.1	64.6	2.8	4.5	16.2	7.8
MT960228	MT960228	186	23	26	22	23.4	82.4	31.7	44.1	52.7	3.8	4.3	23.3	10.5
MT970116	MT970116	182	25	25	21	23.5	92.1	60.3	50.1	67.5	1.8	2.6	17.9	7.4
MT970229	MT970229	183	23	24	19	21.9	*no data*	51.4	69.4	60.4	*no data*	6.1	10.0	8.1
PI610264	Valier	188	22	23	21	21.9	69.8	43.1	49.2	54.0	5.0	8.0	21.2	11.4
BZ594-19	Xena	183	24	23	21	22.5	81.4	37.3	58.2	59.0	3.7	5.7	15.5	8.3
Mean		185	22.7	22.7	20.250		67	44.0	47.3		5.6	8.2	23.0	
CV (s/mean) %		0.5	5.2											
LSD (0.05)		1.617	1.98											

Table 3 Moccasin recrop barley multi-year yield summary of selected varieties, 1992-2002

Exp. 3670 Central Agricultural Research Center, Moccasin, MT

Selected Varieties	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	Average	Gallatin Same Yrs
						bu/a							
Gallatin	53	58	48	56	30	67	39	60	49	52	45	50.7	--
Harrington	45	62	44	65	31	71	36	50	51	57	44	50.5	50.7
Lewis	55	66	44	58	33	76	37	58	54	53	46	52.7	50.7
Bowman	56	62	35[1/]	63	33	64	39	58	52	--	--	53.4	51.1
Chinook	48	68	40	68	28	73	43	52	51	--	--	52.3	51.1
Stark	58	60	38	58	32	70	42	51	51	49	--	50.9	51.2
Baronesse	59	76	44	63	33	73	44	54	57	54	50	55.1	50.0
Xena								53	57	60	54	56.0	51.6
Valier								56	50	53	43	50.4	51.6
Haxby								53	57	50	48	52.1	51.6
MT 960228								57	60	50	53	55.1	51.6
MT 960099									52	50	49	50.0	48.8
MT960100									52	52	51	51.4	48.8
Nursery Mean	52.6	64.3	42.1	63.5	30.6	71.7	41.8	54.9	53.2	52.6	52.6		

[1/] Bowman experienced animal damage in the 1994 trial.

Table 4 Denton recrop barley multi-year yield summary of selected varieties, 1991-2002

Exp. 3671 Central Agricultural Research Center, Moccasin, MT

Selected Varieties	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001*	2002	Average	Gallatin Same Yrs
							bu/a							
Gallatin	65	39	100	40	68	31	78	38	31	55	--	39	53.0	--
Harrington	59	37	102	33	70	25	68	40	33	47	--	40	50.4	53.0
Lewis	68	33	101	41	69	31	79	34	31	55	--	39	52.8	53.0
Bowman	51	37	99	42	67	29	65	37	29	56	--	--	51.2	53.0
Chinook	72	30	106	37	70	30	79	41	30	50	--	--	54.5	53.0
Stark	70	36	105	41	71	32	75	40	30	53	--	--	55.3	53.0
Baronesse	71	37	121	38	73	31	73	41	27	52	--	39	54.8	53.0
Xena									34	56	--	42	43.8	41.5
Valier									27	48	--	40	38.4	41.5
Haxby									34	56	--	36	42.3	41.5
MT 960228									27	51	--	42	39.9	41.5
MT 960099										52	--	40	45.9	46.8
MT960100										49	--	42	45.6	46.8
Nursery Mean	65	36.8	104	38	67.9	29.8	72.3	39.3	31.6	51.8	n/a	40.4		

* Trial was not harvested in 2001 because of extreme uneven germination throughout the nursery.

1992 trial was planted re-crop on pea ground. 1996 trial was re-crop following buckwheat. 1997 trial was recrop following millet. 1998 through 2002 recropped on pulse stubble.