PROJECT TITLE: Dryland Spring Wheat, Durum and Spring Barley Variety Performance Trials near Molt, Montana

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OBJECTIVES: Provide an unbiased agronomic evaluation of improved spring wheat, durum and barley varieties in an environment and cropping system representative of south central Montana.

RESULTS: Pre-plant tillage to control a cheat grass infestation reduced soil moisture to marginal levels for germination and emergence, but precipitation did occur within 24 hours after planting. Subsequent rainfall at the Molt site was below average compared to surrounding locations. Sawflies were present at Molt during 1998, but no sawfly injury was evident in any of the plots during harvest. The spring wheat, durum and spring barley trials averaged 26.7, 26.7 and 66.9 bushels per acre, respectively (Tables 1-3). Yields for all three nurseries were higher than expect given the spotty moisture conditions that prevailed at Molt during 1998. No differences in yield were observed among spring wheat (Table 1) and spring barley (Table 3) entries. Durum yields varied from 29.6 bushels per acre for 'Belzer' to 23.0 bushels per acre for 'Lloyd'. Test weights were lighter than normal, especially among the durum and spring barley entries. Most spring barley varieties produced an excessive percentage of thin kernels. 'Bowman', 'Logan' and 'Stark' spring barleys produced the most acceptable combination of yield, test weight and plump kernels under the conditions experienced at Molt during the 1998 cropping season.

SUMMARY: This was first year for trials at this location. Limited moisture availability and above normal temperatures during grain fill limited yield potential and adversely affected grain quality factors for all three trials grown at this location during 1998. Yield potential of the durum entries tested equaled those of the spring wheats.

FUTURE PLANS: The spring small grain nurseries will be re-established near Molt in 1999. Program will be expanded to include additional dryland and irrigated test sites.

Table 1. Performance of 21 hard red and hard white spring wheats under summer fallow conditions near Molt, Montana during 1998. Exp. No. 989990, Southern Agriculture Research Center. Cultivars listed in declining order of grain yield. Study planted April 27, 1997; harvested August 12, 1998.

Variety	1/ Grain Yield	Test Weight	Grain Moisture	2/ Grain Protein	Plant Height
	-bu/ac-	-lb/bu-	-%-	-%-	-inches-
Westbred Express	29.9	56.4	8.0	15.0	23.6
MT9609	29.7	56.7	8.1	15.4	26.0
MT9433	28.7	60.3	8.7	13.8	28.1
Amidon	28.5	59.0	8.4	13.7	27.2
Grandin	28.4	57.6	8.2	13.9	26.7
Trenton	28.2	57.8	8.3	14.7	29.3
Glenman	28.1	56.4	8.3	14.5	25.8
McNeal	28.1	56.8	8.3	14.7	24.3
Pioneer 2375	28.0	57.7	8.2	14.8	24.6
Stoa	27.3	55.4	8.1	16.1	26.7
Hi-Line	27.2	56.7	7.9	16.0	24.0
Rambo	26.5	59.3	8.5	14.8	25.2
Ernest	25.6	58.6	8.3	15.7	26.0
Fergus	25.6	59.1	8.7	14.1	24.7
Westbred 936	25.6	56.1	8.2	15.3	21.8
Lew	25.4	59.2	8.6	14.7	28.4
Newana	24.8	58.8	8.2	14.4	22.9
Fortuna	24.7	58.8	8.5	13.7	27.5
Westbred 926	24.7	57.3	8.2	15.6	21.9
Len	23.6	57.8	8.1	15.4	23.8
MTHW9420 (hard white)	22.5	57.0	8.1	15.1	22.5
Average	26.7	57.8	8.3	14.8	25.3
LSD (p=0.05)	ns	ns	ns		2.2
CV%	14.1	3.6	4.5		5.4

1/ Yields are based on a 60 pound standard bushel weight and adjusted to 12 percent grain moisture content.

2/ Determined from a single sample per entry derived by bulking three replications. Grain protein values adjusted to 12 percent grain moisture content.

ns Indicates no statistical differences between entries for means within a column at the p=0.05 probability level.

Table 2. Performance of 15 durum and hard red spring wheats under summer fallow conditions near Molt, Montana during 1998. Exp. No. 989890, Southern Agriculture Research Center, Huntley. Cultivars listed in declining order of grain yield. Study planted April 27, 1997; harvested August 12, 1998.

Variety	1/ Grain Yield	Test Weight	Grain Moisture	2/ Grain Protein	Plant Height
	-bu/ac-	-lb/bu-	-%-	-%-	-inches-
Belzer	**29.6****	55.6	8.1	16.8	27.7
McNeal (hard red spring)	**28.9***	52.9	7.5	17.7	25.1
Plenty	**28.6***	56.3	7.8	17.7	31.2
Munich	**28.5***	56.2	7.8	16.6	23.2
Monroe	**28.3***	56.0	7.8	17.6	28.6
Medora	**27.5***	58.4	8.3	16.0	29.5
Laker	**27.4***	57.7	8.7	15.5	22.9
Renville	**26.8***	55.8	8.0	17.4	27.9
Vic	**26.4***	58.4	8.4	16.4	27.6
Kyle	**26.1***	56.5	8.2	16.7	30.5
Sceptre	25.9	56.6	8.1	16.2	25.5
Ben	25.1	57.4	8.2	17.7	27.8
Ward	24.7	56.5	7.9	18.5	31.2
Crosby	24.1	56.4	8.1	17.4	29.4
Lloyd	23.0	55.1	8.2	16.3	21.0
Average	26.7	56.4	8.1	17.0	27.3
LSD (p=0.05)	3.8	2.2	0.5		2.6
CV%	8.5	2.4	3.8		5.7

1/ Yields are based on a 60 pound standard bushel weight and adjusted to 12 percent grain moisture content.

2/ Determined from a single sample per entry derived by bulking three replications. Grain protein values adjusted to 12 percent grain moisture content.

** Indicates highest yielding variety within a column.

* Indicates varieties yielding equal to highest yielding variety within a column based on Fisher's protected LSD (p=0.05).

Table 3. Performance of 16 spring barleys under summer fallow conditions near Molt, Montana during 1998. Exp. No. 983691, Southern Agriculture Research Center, Huntley. Cultivars listed in declining order of grain yield. Study planted April 27, 1997; harvested August 12, 1998.

Variety	1/ Grain Yield	Test Weight	Grain Moisture	2/ Grain Protein	Plant Height	Kernel Size	
						Plump	Thin
	-bu/ac-	-lb/bu-	-%-	-%-	-inches-	-%-	-%-
Chinook	72.0	46.0	8.0	14.3	24.3	26.1	70.1
Bowman	71.8	49.5	8.0	13.5	24.5	74.2	17.5
MTLB 5	71.8	46.0	8.1	14.0	26.0	19.2	79.8
MTLB 32	71.3	43.0	7.7	13.6	24.8	19.7	72.2
Stark	70.2	49.1	8.0	13.2	25.8	62.4	17.6
Logan	69.1	49.5	8.3	13.3	24.5	60.1	28.4
MTLB 6	69.1	47.4	8.0	13.8	24.2	26.4	48.4
MT910189	68.9	46.3	8.1	13.7	25.2	35.4	58.7
MTLB 57	68.7	46.2	7.8	12.6	23.7	29.2	66.2
Gallatin	68.2	45.9	7.7	15.1	25.1	14.1	82.9
Hector	64.5	46.2	7.8	14.1	25.0	18.9	66.9
Baronesse	63.9	44.5	7.6	13.6	22.3	28.8	45.3
Harrington	62.8	42.9	7.6	14.6	25.2	42.7	43.2
MT920073	60.8	45.0	7.8	14.1	22.3	27.7	58.0
Lewis	58.6	46.4	8.1	14.2	24.5	33.9	60.2
MT910150	58.3	46.0	7.9	15.0	24.2	23.9	38.3
Average	66.9	46.3	7.9	13.9	24.5	33.9	53.4
LSD (p=0.05)	ns	3.2	ns		ns	31.3	35.7
CV%	10.2	4.2	3.4		6.8	55.3	40.1

1/ Yields are based on a 48 pound standard bushel weight and adjusted to 12 percent grain moisture content.

2/ Determined from a single sample per entry derived by bulking three replications. Grain protein values on an as is moisture basis.

ns Indicates no statistical differences between entries for means within a column at the p=0.05 probability level.