RESULTS OF AGRONOMIC AND WEED SCIENCE RESEARCH CONDUCTED IN SOUTH CENTRAL MONTANA - 2006

The Annual Report of the Investigations at and Administration of the Southern Agricultural Research Center, Huntley, Montana

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PROJECT TITLE:

Off-Station Spring Barley Variety Performance Trials in South Central Montana. (Exps. 063691, 063692, 063794 and 063795). This research is partially supported by the Montana Wheat and Barley Committee.

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OBJECTIVES:

To provide growers in south central Montana with a reliable, unbiased, up-to-date source of information that will permit valid comparisons among improved spring barley varieties. This information should help spring barley producers in south central Montana select varieties best suited to their particular area and growing conditions.

METHODS:

Off-station spring barley trials were conducted under dryland conditions near Molt and Ryegate, and under flood irrigation near Fromberg and Hysham, Montana (Fig. 1). Twenty four spring barley entries (21 commercial cultivars, 3 experimental lines) representing both feed and malt type cultivars were grown at all locations.

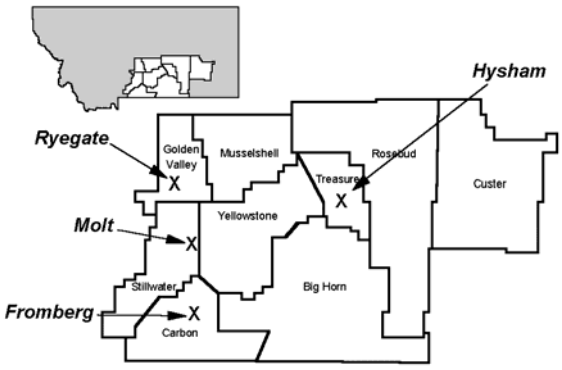

Figure 1. 2006 off-station spring barley trial locations in south central Montana.

All studies were planted using a randomized complete block design with three replications. All entries were seeded at approximately 0.6 million seeds per acre

(~14 seed per foot^2) under dryland conditions and 1.1 million seeds per acre (~24 seed per foot^2) under irrigation. Actual seeding rates were calculated from the thousand kernel weight determined for the seed lot of each cultivar (Table 1), and varied from 44 to 74 pounds per acre for the dryland sites and from 75 to 126 pounds per acre under irrigation. Seeding rates were not adjusted for germination. Dryland test plots established on conventional summer fallow consisted of a 15-foot, 4-row plot with 12-inch row spacing. Irrigated test plots consisted of a 15-foot, 7-row plot with 6-inch row spacing. All rows of each test plot were trimmed 36 inches and harvested using an experimental-plot combine. Recorded grain yields were adjusted to 13% grain moisture content, and are reported in bushels per acre based on a 48 pound standard bushel weight. Test weight (lb/bu, pounds per bushel) and grain moisture content (%, percent) were obtained for each plot using a Dickey-john™ GAC 2100 grain analyzer. Grain protein (%, percent) was determined for each entry bulked across replications and is reported on a 100% dry matter basis. Plant height was measured in inches from the soil surface to the top of the head, excluding the awns if present. Lodging severity, where observed, was recorded on a 0 to 9 scale representing no lodging to all stems lying flat on the ground, respectively. Percent plump and thin kernels were determined by measuring the amount of a ~100 gram sub-sample retained above a 6-64" slotted screen and passing through a 5½-64" slotted screen, respectively, following 30 oscillations on a Strand™ sizer shaker.

Table 1. Adjusted seeding rates used to establish 24 spring barley cultivars tested at four off-station sites in south central Montana during 2006.

Cultivar	Thousand Kernel Weight	Seeds per Pound	1/ Dryland Seeding Rate		2/ Irrigated Seeding Rate	
			per plot	per acre	per plot	per acre
	grams	#	grams	pounds	grams	pounds
Boulder	52.6	8,635	45.1	72	66.8	122
Calgary	42.1	10,787	36.1	58	53.5	98
Conrad	43.1	10,533	37.0	59	54.8	100
Copeland	41.8	10,851	35.9	57	53.2	97
Craft	54.3	8,363	46.6	74	69.0	126
Drummond	35.4	12,821	30.4	49	45.0	82
Eslick	47.1	9,634	40.4	65	59.9	109
Harrington	32.2	14,101	27.6	44	40.9	75
Haxby	48.4	9,380	41.5	66	61.5	112
Hays	47.3	9,598	40.6	65	60.1	110
Kendall	41.8	10,869	35.8	57	53.1	97
Legacy	32.7	13,874	28.1	45	41.6	76
Merit	37.3	12,158	32.0	51	47.5	87
Metcalfe	39.4	11,523	33.8	54	50.1	92
Moravian 37	45.9	9,887	39.4	63	58.4	107
Moravian 69	49.1	9,253	42.1	67	62.4	114
Morex	37.8	12,004	32.5	52	48.1	88
Robust	34.4	13,202	29.5	47	43.7	80
Stellar	35.8	12,694	30.7	49	45.5	83
Tradition	38.2	11,886	32.8	52	48.5	89
Xena	44.3	10,251	38.0	61	56.3	103
MT910189	49.3	9,216	42.3	68	62.6	114
MT960101	43.8	10,369	37.6	60	55.6	102
MT970229	50.5	8,998	43.3	69	64.1	117

1/ Equivalent to 0.6 million seeds per acre (14 seeds per foot^2) on a mass basis.
2/ Equivalent to 1.1 million seeds per acre (24 seeds per foot^2) on a mass basis.

RESULTS:

The 2006 spring barley test sites were unusually dry over-winter, with very little snow accumulating during December, January and February. Dry conditions prevailed until mid-March, when early spring rains produced above average precipitation during a 3 week period from late March to early April. All four of the test locations planted in the spring of 2006 possessed adequate soil moisture to facilitate germination and emergence. Spring barley stands appeared fairly uniform at all sites before the end of May.

The region was unusually dry and warm during May, June and July. Huntley received only 1.7 inches of precipitation during this period in 2006, compared to 5.9 inches this location normally receives during this three month interval. Accumulated heat units at Huntley were 20 percent above normal from May 1 to the middle of July. The trial at Ryegate was severely damaged by drought and grasshopper infestations during June and July, and was not harvested for yield in 2006. Hot, dry weather beginning in late May and continuing through June and July, hastened maturation of the crop.

The 2006 spring barley trial at Molt produced an average yield of 11.5 bu/a (Table 2). Grain yields ranged from 19.2 bu/a for 'Haxby' to 1.9 bu/a for 'Hays'. Eleven commercial entries ('Boulder', 'Conrad', 'Craft', 'Drummond', 'Eslick', 'Harrington', 'Legacy', 'Robust', 'Stellar', 'Tradition', 'Xena') produced yields that ranged from 18.4 to 10.7 bu/a, statistically equal to that of the highest yielding entry. Average test weight was 42.7 pounds per bushel. Grain protein content averaged 10.5 percent and ranged from 8.8 to 12.5 percent. Thin kernels averaged 45.5 percent, and were excessively high for the malt type cultivars tested at this site. Two-year average yield for barley varieties tested during 2005 and 2006 at Molt averaged 12.2 bu/a. Three-year average yield for barley varieties tested during 2004, 2005 and 2006 in Molt averaged 23.2 bu/a. Boulder and Haxby have been the highest yielding entries for past two and three years, respectively.

The average spring barley yield at Fromberg in 2006 was 115.8 bu/a and ranged from 134.9 bu/a for 'Moravian 69' to 88.0 bu/a for Hays (Table 3). Ten other commercial entries (Boulder, 'Calgary', 'CDC Kendall', Conrad, Craft, Drummond, Haxby, Legacy, 'Moravian 37' and Tradition) produced yields that ranged from 116.8 to 128.5 bu/a, statistically equal to that of the highest yielding entry. Average test weight across all entries tested at Fromberg for 2006 was 51.7 lb/bu. Grain protein averaged 12.0 percent and ranged from 11.4 to 12.7 percent. Mean percent plump and thin kernels were 84.9 and 6.8 percent, respectively. Two-year average yield for spring barley varieties tested during 2005 and 2006 at Fromberg averaged 111.3 bu/a. Three-year average yield for spring barley varieties tested during 2004 to 2006 averaged 105.3 bu/a.

The average spring barley yields under irrigated condition at Hysham was 110.3 bu/a (Table 4). Spring barley yields ranged from 14.6 bu/a for Hays to 163.9 bu/a for 'Xena'. Nine other commercial entries ('AC Metcalfe', Boulder, Calgary, 'CDC Copeland', CDC Kendall, Conrad, Harrington, Moravian 37 and Moravian 69) produced yields that ranged from 133.3 to 157.8 bu/a, statistically equal to that of the highest yielding entry. Average test weight across all entries tested at Hysham for 2006 was 52.2 lb/bu. Grain protein averaged 10.6 percent and ranged from 9.7 to 11.8 percent. Mean percent plump and thin kernels were 85.4 and 6.9 percent, respectively. Two-year average yield for barley varieties tested during 2004 and 2006 in Hysham averaged 104.8 bu/a. Three-year average yield for barley varieties tested from 2003 to 2006 in Hysham averaged 107.1 bu/a.

SUMMARY:

Lingering effects of the prolonged drought were still evident during grain fill at Molt trial also suffered from drought conditions. Discerning yield differences and predicting relative performance among barley entries is difficult under such stressful conditions. Averaged across both the Hysham and Fromberg locations for the past three years, CDC Copeland has been the highest yielding barley grown under irrigation averaging 121.4 bu/a (Table 5). AC Metcalfe, CDC Kendall, Craft, Drummond, Harrington, Legacy, 'Merit', and Tradition have produced irrigated yields equal to those of CDC Copeland for the past three years.

FUTURE PLANS:

Off-station spring barley variety evaluations will continue in 2007.

Table 2. Performance of 24 spring barley cultivars and experimental lines tested under dryland conditions near Molt, Montana during 2006. Cultivars listed alphabetically. (Exp. 063691).

Cultivar	Grain Yield 1/ 2006	Grain Yield 1/ 2005-2006	Grain Yield 1/ 2004-2006	Test Weight	Grain Moisture	Grain Protein 2/	Plump Kernels	Thin Kernels	Plant Height
	bushels/acre			lb/bu	%	%	%	%	inches
AC Metcalfe	4.7	6.9	16.2	44.3	7.9	12.5	21.2	37.4	16.7
Boulder	**18.2***	**17.3****		45.7	6.9	9.2	33.6	29.3	17.0
Calgary	8.4			44.5	8.0	8.8	15.7	53.7	13.0
CDC Copeland	8.5	11.4	**25.1***	36.9	6.6	11.2	25.2	35.2	16.4
CDC Kendall	9.6	10.8		42.0	7.8	12.1	36.3	34.5	17.6
Conrad	**14.5***	**16.9***		42.2	7.6	10.9	23.2	43.2	16.8
Craft	**14.1***	**12.3***	**21.5***	43.9	6.7	10.5	33.0	27.6	20.9
Drummond	**10.7***	10.2		43.2	7.0	9.1	28.3	39.5	18.5
Eslick	**18.4***	**17.2***	**26.5***	43.7	7.2	9.3	5.9	60.3	17.8
Harrington	**12.0***	**13.7***	**23.5***	40.8	7.1	10.6	33.1	35.6	18.1
Haxby	**19.2****	**14.7***	**27.6****	45.1	6.8	9.4	6.9	65.9	18.8
Hays	1.9	2.8	16.3	-.-	7.3	11.2	12.1	58.4	15.5
Legacy	**15.1***	**13.0***		45.1	7.6	9.5	17.6	50.0	21.2
Merit	9.7	**12.1***		40.1	6.7	10.6	16.9	50.6	17.7
Moravian 37	9.9			43.6	5.8	11.6	47.8	19.9	16.6
Moravian 69	9.6			39.0	6.5	12.5	6.8	67.5	15.1
Morex	9.3			44.4	6.6	10.4	20.9	47.5	21.4
Robust	**11.1***	9.5		41.1	6.6	10.7	14.8	54.9	20.0
Stellar	**12.1***			39.7	6.5	10.3	13.4	58.3	18.4
Tradition	**10.8***	10.0	**24.4***	43.7	7.0	9.4	28.1	36.5	17.2
Xena	**13.2***	**13.9***		41.4	6.9	9.4	7.5	60.4	18.8
MT910189	**10.8***	**11.9***	**24.8***	45.4	6.8	11.6	27.9	30.1	17.0
MT960101	**10.7***	**12.5***		41.3	7.1	11.3	5.7	63.6	15.8
MT970229	**13.4***	**14.4***	**26.4***	45.0	7.6	10.4	35.8	31.4	17.9
Average	11.5	12.2	23.2	42.7	7.0	10.5	21.6	45.5	17.7
PLSD (p=0.05)	8.5	5.8	7.3	-.-	-.-	-.-	-.-	-.-	-.-
CV%	44.9	39.1	31.6	-.-	-.-	-.-	-.-	-.-	-.-

1/ Yields are based on a 48 pound standard bushel weight and adjusted to 13.0 percent moisture content.
2/ Grain protein values determined from bulked samples and adjusted to a 100 percent dry matter basis.
** Indicates highest yielding cultivar within a column.
* Indicates cultivars yielding equal to highest yielding cultivar within a column based on Fisher's protected LSD (p=0.05).
ns Indicates no significant difference between cultivars within a column based on Fisher's protected LSD (p=0.05).

Molt Dryland Spring Barley (Exp. 063691)

Planted:	May 3, 2006	Harvested:	August 9, 2006
Fertility:	11-52-00, 100 lbs/a in-furrow at planting		
Herbicide:	Roundup Ultra, PRE, 16 oz/a, May 8, 2006	Insecticide:	none applied
Previous Crop:	summer fallow	Precipitation:	n/a

Table 3. Performance of 24 spring barley cultivars and experimental lines tested under irrigated conditions near Fromberg, Montana during 2006. Cultivars listed alphabetically. (Exp. 063794).

Cultivar	Grain Yield 1/ 2006	Grain Yield 1/ 2005-2006	Grain Yield 1/ 2004-2006	Test Weight	Grain Moisture	Grain Protein 2/	Plump Kernels	Thin Kernels	Plant Height	Lodging
	----------	bushels/acre	----------	- lb/bu -	- % -	- % -	- % -	- % -	- inches -	0-9
AC Metcalfe	104.7	106.5	106.0	52.1	9.4	12.3	89.0	5.0	34.0	0.3
Boulder	**126.0***	**120.4***		53.0	9.2	12.7	87.9	5.9	31.2	4.3
Calgary	**128.5***	**126.9****		53.0	9.4	12.0	88.4	5.0	27.9	2.0
CDC Copeland	112.3	107.3	107.1	50.8	9.5	11.6	85.1	7.4	37.3	2.0
CDC Kendall	**120.9***	**110.8***	104.1	52.5	9.6	12.7	90.5	4.6	35.5	1.3
Conrad	**127.5***	**117.8***		52.0	9.6	12.0	89.8	4.4	31.4	0.0
Craft	**127.8***	**122.0***	113.7	53.9	9.7	11.6	88.6	5.6	36.2	1.3
Drummond	**123.2***	**113.3***	108.1	51.5	9.1	11.8	87.6	4.9	35.9	1.0
Eslick	108.3	**110.6***		50.8	9.2	12.1	77.0	12.7	29.8	6.0
Harrington	112.4	107.5	103.4	50.8	9.2	12.3	83.7	8.3	33.9	3.0
Haxby	**118.5***	**117.7***	112.8	54.5	9.6	11.9	90.1	4.7	32.3	4.3
Hays	88.0	92.1		46.0	8.6	12.5	45.6	23.7	32.7	8.0
Legacy	**116.8***	**114.4***	109.3	51.1	9.3	11.7	83.8	6.1	34.8	3.3
Merit	110.5	**109.9***	109.8	49.6	8.9	11.9	79.7	9.4	35.5	1.0
Moravian 37	**127.5***			51.9	9.2	11.7	92.0	3.4	30.3	1.0
Moravian 69	**134.9****			51.2	9.3	11.7	91.9	2.6	28.3	0.7
Morex	104.5	93.1	94.4	50.6	9.1	12.4	84.7	6.2	35.3	5.7
Robust	96.5	87.9	90.7	52.0	9.3	12.4	84.8	5.3	37.4	1.3
Stellar	102.1			51.8	9.1	11.4	92.9	2.7	35.6	0.7
Tradition	**124.3***	**111.4***	104.1	52.2	9.1	11.9	93.7	1.7	35.2	1.0
Xena	107.5	**117.9***		50.7	9.4	12.1	75.8	12.7	32.7	3.0
MT910189	113.0	106.4	105.6	51.7	9.3	11.8	84.7	7.6	30.5	6.0
MT960101	115.5	**120.0***		52.4	9.5	12.1	79.3	9.0	30.9	2.3
MT970229	**127.9***	**123.5***		54.3	9.6	11.9	92.0	3.4	34.3	1.0
Average	115.8	111.3	105.3	51.7	9.3	12.0	84.9	6.8	33.3	2.5
PLSD (p=0.05)	19.0	17.7	ns	1.2	0.3	-.-	8.6	4.5	2.2	3.3
CV%	10.0	13.2	12.6	1.4	2.1	-.-	6.2	40.1	4.0	79.8

1/ Yields are based on 48 pound standard bushel weight and adjusted to 13.0 percent moisture content.
2/ Grain protein values determined from bulked samples and adjusted to a 100 percent dry matter basis.
** Indicates highest yielding cultivar within a column.
* Indicates cultivars yielding equal to highest yielding cultivar within a column based on Fisher's protected LSD (p=0.05).
ns Indicates no significant difference between cultivars within a column based on Fisher's protected LSD (p=0.05).

Fromberg Irrigated Spring Barley (Exp. 063794)

Planted:	April 6, 2006	Harvested:	August 7, 2006
Fertility:	n/a		
Herbicide:	n/a		
Previous Crop:	sugar beets	Irrigation:	flood

Table 4. Performance of 24 spring barley cultivars and experimental lines tested under irrigated conditions near Hysham, Montana during 2006. Cultivars listed alphabetically. (Exp. 063795).

Cultivar	Grain Yield 1/ 2006	Grain Yield 1/ 2005-2006	Grain Yield 1/ 2004-2006	Test Weight	Grain Moisture 2/	Grain Protein	Plump Kernels	Thin Kernels	Plant Height	Lodging 3/
	bu/a			lb/bu	%	%	%	%	inches	0-9
AC Metcalfe	**137.5***	122.2	127.5	53.3	11.5	10.4	88.7	5.4	37.6	3.3
Boulder	**157.8***	124.2		53.5	11.5	11.2	85.5	7.4	35.4	3.7
Calgary	**136.5***	118.4		54.2	11.8	10.2	90.9	3.4	32.2	1.3
CDC Copeland	**150.6***	129.5	135.7	52.6	11.1	10.0	88.5	5.4	43.4	1.7
CDC Kendall	**133.3***	110.3	115.2	52.4	11.5	11.2	87.0	6.1	36.0	4.3
Conrad	**153.7***	125.6		52.4	11.9	10.8	86.5	6.2	30.1	1.7
Craft	70.2	92.4	99.3	53.8	11.6	9.7	87.3	5.8	35.5	1.3
Drummond	40.2	76.4	89.0	51.6	10.7	10.7	87.0	5.4	31.7	1.7
Eslick	129.6	107.0		51.8	12.0	9.9	80.9	9.2	33.2	6.7
Harrington	**143.9***	130.6	130.9	52.5	11.4	10.5	88.4	5.2	34.8	3.3
Haxby	34.3	68.7	77.5	52.0	12.2	10.6	75.8	11.7	30.7	2.7
Hays	14.6	55.6		49.2	11.2	11.8	61.2	22.3	33.6	2.0
Legacy	80.7	86.9	104.0	52.0	11.2	10.9	89.7	4.2	38.0	2.3
Merit	125.7	108.1	120.0	50.3	11.6	10.3	87.1	7.0	37.4	3.0
Moravian 37	**139.3***			53.3	11.4	10.2	90.2	4.7	32.7	1.7
Moravian 69	**148.5***			51.7	11.5	9.7	88.8	4.8	30.2	1.3
Morex	37.7	70.7	80.7	50.5	10.9	11.7	80.3	7.2	33.9	1.7
Robust	26.5	62.6	76.9	52.0	11.1	11.5	87.0	5.2	38.8	1.7
Stellar	87.8			51.0	11.0	10.4	90.6	4.3	35.8	1.7
Tradition	75.4	87.9	103.6	52.1	10.8	10.9	92.1	3.0	37.2	1.0
Xena	**163.9****	137.6		52.2	11.9	9.9	80.2	10.0	32.1	0.3
MT910189	**152.1***	128.1	131.9	52.4	11.6	10.3	86.3	6.6	33.4	2.7
MT960101	**147.2***	123.7		52.6	11.7	10.3	82.5	8.9	34.3	2.0
MT970229	**158.9***	133.9		54.2	11.4	10.1	88.2	5.3	36.4	1.3
Average	110.3	104.8	107.1	52.2	11.4	10.6	85.4	6.9	34.8	2.3
PLSD (p=0.05)	33.2	ns	ns	1.7	0.7	-.-	8.7	5.0	5.5	3.2
CV%	18.3	61.7	42.9	2.0	3.5	-.-	6.2	43.8	9.5	85.5

1/ Yields are based on a 48 pound standard bushel weight and adjusted to 13.0 percent moisture content.
2/ Grain protein values determined from bulked samples and adjusted to a 100 percent dry matter basis.
3/ Lodging severity scores of 0 to 9 represent no lodging to all stems flat on the ground, respectively.
ns Indicates no significant difference between cultivars within a column based on Fisher's protected LSD (p=0.05).

Hysham Irrigated Spring Barley (Exp. 063795)

Planted:	March 17, 2006	Harvested:	July 25, 2006
Fertility:	35-60-60, PPI, March 10, 2006		
Herbicide:	Bronate Advanced, 12.8 oz/a; Starane 4.8 oz/a; Express 0.1 oz/a; Headline 3 oz/a; non-ionic surfactant, 10 oz/a, POST, May 11, 2006		
Insecticide:	Warrior, 2.5 oz/a, POST, May 11, 2006		
Previous Crop:	sugar beets	Irrigation:	flood

Table 5. Performance of 24 spring barley cultivars and experimental lines tested under irrigated conditions at two locations in south central Montana during 2006. Cultivars listed alphabetically.

Cultivar	Grain Yield 1/ 2006	Grain Yield 1/ 2005-2006	Grain Yield 1/ 2004-2006	Test Weight	Grain Moisture 2/	Grain Protein	Plump Kernels	Thin Kernels	Plant Height	Lodging 3/
	bu/a			lb/bu	%	%	%	%	inches	0-9
AC Metcalfe	121.1	114.4	**116.8***	52.7	10.5	11.4	88.9	5.2	35.8	1.8
Boulder	141.9	122.3		53.3	10.4	12.0	86.7	6.7	33.3	4.0
Calgary	132.5	122.7		53.6	10.6	11.1	89.7	4.2	30.0	1.7
CDC Copeland	131.5	118.4	**121.4****	51.7	10.3	10.8	86.8	6.4	40.3	1.8
CDC Kendall	127.1	110.5	**109.6***	52.5	10.6	12.0	88.7	5.4	35.7	2.8
Conrad	140.6	121.7		52.2	10.8	11.4	88.1	5.3	30.8	0.8
Craft	99.0	107.2	**106.5***	53.9	10.7	10.7	87.9	5.7	35.9	1.3
Drummond	81.7	94.9	**98.5***	51.6	9.9	11.3	87.3	5.2	33.8	1.3
Eslick	118.9	108.8		51.3	10.6	11.0	79.0	10.9	31.5	6.3
Harrington	128.2	119.0	**117.1***	51.7	10.3	11.4	86.1	6.8	34.3	3.2
Haxby	76.4	93.2	95.2	53.3	10.9	11.3	83.0	8.2	31.5	3.5
Hays	51.3	73.9		47.6	9.9	12.2	53.4	23.0	33.2	5.0
Legacy	98.8	100.6	**106.7***	51.6	10.2	11.3	86.7	5.2	36.4	2.8
Merit	118.1	109.0	**114.9***	49.9	10.3	11.1	83.4	8.2	36.4	2.0
Moravian 37	133.4			52.6	10.3	11.0	91.1	4.0	31.5	1.3
Moravian 69	141.7			51.4	10.4	10.7	90.4	3.7	29.2	1.0
Morex	71.1	81.9	87.6	50.6	10.0	12.1	82.5	6.7	34.6	3.7
Robust	61.5	75.3	83.8	52.0	10.2	12.0	85.9	5.2	38.1	1.5
Stellar	95.0			51.4	10.0	10.9	91.8	3.5	35.7	1.2
Tradition	99.9	99.6	**103.8***	52.1	9.9	11.4	92.9	2.3	36.2	1.0
Xena	135.7	127.7		51.5	10.7	11.0	78.0	11.4	32.4	1.7
MT910189	132.6	117.2	**118.7***	52.1	10.5	11.1	85.5	7.1	31.9	4.3
MT960101	131.3	121.8		52.5	10.6	11.2	80.9	9.0	32.6	2.2
MT970229	143.4	128.7		54.2	10.5	11.0	90.1	4.3	35.4	1.2
Average	113.0	108.0	106.2	52.0	10.4	11.3	85.2	6.8	34.0	2.4
PLSD (p=0.05)	ns	ns	24.0	1.6	0.5	0.7	8.1	3.3	3.4	ns
CV%	49.7	41.0	33.9	2.5	4.1	2.9	8.0	41.0	8.4	107.1
Location Years	2	4	6	2	2	2	2	2	2	2

1/ Yields are based on a 48 pound standard bushel weight and adjusted to 13.0 percent moisture content.
2/ Grain protein values determined from bulked samples and adjusted to a 100 percent dry matter basis.
3/ Lodging severity scores of 0 to 9 represent no lodging to all stems flat on the ground, respectively.
** Indicates highest yielding cultivar within a column.
* Indicates cultivars yielding equal to highest yielding cultivar within a column based on Fisher's protected LSD (p=0.05).
ns Indicates no significant difference between cultivars within a column based on Fisher's protected LSD (p=0.05).

Table 6. Grain yield[1/] of 24 spring barley cultivars tested at three locations in south central Montana during 2006. Cultivars listed alphabetically.

Cultivar	Molt Dryland	Fromberg Irrigated	Hysham Irrigated	Irrigated Average	Three Location Average
	----------	----------	bushels per acre	----------	----------
AC Metcalfe	4.7	104.7	**137.5***	121.1	82.3
Boulder	**18.2***	**126.0***	**157.8***	141.9	100.7
Calgary	8.4	**128.5***	**136.5***	132.5	91.1
CDC Copeland	8.5	112.3	**150.6***	131.5	90.5
CDC Kendall	9.6	**120.9***	**133.3***	127.1	88.0
Conrad	**14.5***	**127.5***	**153.7***	140.6	98.6
Craft	**14.1***	**127.8***	70.2	99.0	70.7
Drummond	**10.7***	**123.2***	40.2	81.7	58.0
Eslick	**18.4***	108.3	129.6	118.9	85.4
Harrington	**12.0***	112.4	**143.9***	128.2	89.5
Haxby	**19.2****	**118.5***	34.3	76.4	57.3
Hays	1.9	88.0	14.6	51.3	34.8
Legacy	**15.1***	**116.8***	80.7	98.8	70.9
Merit	9.7	110.5	125.7	118.1	81.9
Moravian 37	9.9	**127.5***	**139.3***	133.4	92.2
Moravian 69	9.6	**134.9****	**148.5***	141.7	97.7
Morex	9.3	104.5	37.7	71.1	50.5
Robust	**11.1***	96.5	26.5	61.5	44.7
Stellar	**12.1***	102.1	87.8	95.0	67.3
Tradition	**10.8***	**124.3***	75.4	99.9	70.2
Xena	**13.2***	107.5	**163.9****	135.7	94.8
MT910189	**10.8***	113.0	**152.1***	132.6	92.0
MT960101	**10.7***	115.5	**147.2***	131.3	91.1
MT970229	**13.4***	**127.9***	**158.9***	143.4	100.0
Average	11.5	115.8	110.3	113.0	79.2
PLSD (p=0.05)	8.5	19.0	33.2	ns	ns
CV%	44.9	10.0	18.3	49.7	60.8

1/ Yields are based on 48 pound standard bushel weight and adjusted to 13.0 percent moisture content.

** Indicates highest yielding cultivar within a column.

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

ns Indicates no significant difference between cultivars within a column based on Fisher's protected LSD (p=0.05).