



RESULTS OF AGRONOMIC AND WEED SCIENCE RESEARCH CONDUCTED IN SOUTH CENTRAL MONTANA - 2004

The Annual Report of the Investigations at and Administration of the
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- PROJECT TITLE:** Dryland and Irrigated Winter Wheat Variety Performance Trials near Forsyth, Fly Creek, Huntley, Lodge Grass and Rapelje, Montana. (Exps. 043880, 043881, 043882, 043883 and 043884).
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- OBJECTIVES:** To provide wheat growers in south central Montana with a reliable, unbiased, up-to-date source of information that will permit valid comparisons among improved winter wheat varieties. This information should help winter wheat producers in south central Montana select varieties best suited to their particular area and growing conditions.
- METHODS:** The 2004 off-station winter wheat trials were established under dryland conditions near Forsyth and Rapelje under conventional summer fallow conditions; Fly Creek and Lodge Grass under no-till, chemical fallow conditions; and under no-till, irrigation at Huntley (Fig. 1). Each trial possessed 24 winter wheat entries (19 cultivars, 5 experimental lines), and was planted using a randomized complete block design with three replications. Dryland test plots established on conventional summer fallow consisted of a 15-foot, 4-row plot with 12-inch row spacing. Dryland test plots no-till planted into chemical fallow consisted of a 15-foot, 4-row plot with 14-inch row spacing. The irrigated test plots consisted of a 15-foot, 7-row plot with 6-inch row spacing. Information pertaining to the traits and characteristics of the 24 winter wheat entries are provided in Table 1.

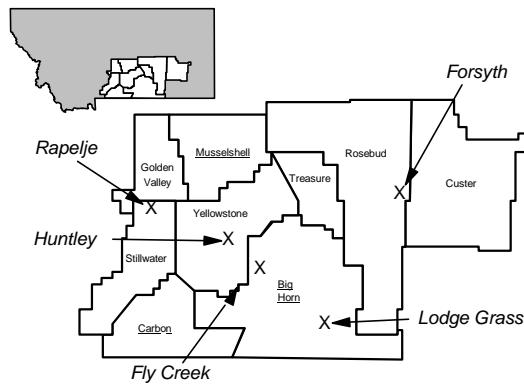


Figure 1. 2004 off-station winter wheat trial locations in south central Montana.

All rows of each harvested 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 60 pound standard bushel weight. Two year (2003-04) and three year (2002-04) yield averages are provided for cultivars tested during previous years. Test weight (pounds per bushel) and percent grain moisture content were obtained for each plot using a Dickey-john™ GAC 2100 grain analyzer. Grain protein was determined by near-infrared reflectance by the MSU Cereal Quality Lab for each entry bulked across replications. Reported grain protein values have been adjusted to a 12% grain moisture content. Plant height was measured in inches from the soil surface to the top of the head, excluding the awns if present. Lodging of some cultivars was noted at the irrigated Huntley location during 2004, and recorded on a 0 to 9 scale representing no lodging to all stems lying flat on the ground, respectively. Information pertaining to the specific cultural management of each study site is listed at the bottom of their respective data table (Tables 2 through 5).

RESULTS:

Drought stress continues to plague the dryland site near Rapelje, which was abandoned prior to harvest due to extremely poor stand establishment. The winter wheat trial previously planted in the Indian Creek area along the Big Horn/Yellowstone County border, was relocated in 2004 to the east in the Fly Creek drainage of west, central Big Horn County. This site was no-till planted into chemical fallow to reflect the predominant rotation system used in this region of the state. Several compacted strips, resulting from previous traffic in the field, affected crop growth that affected portions of all three replications. The Forsyth and Lodge Grass dryland sites both possessed adequate soil moisture for emergence and stand establishment, but both sites experienced some stand reduction due to winterkill. The trial at Lodge Grass also experienced hail damage 3 to 4 weeks before harvest. The irrigated trial near Huntley was no-till planted into fairly heavy spring wheat residue. Soil test results indicated substantial soil nitrogen levels in the profile at planting. Supplemental nitrogen applied to meet yield goals was likely tied up by the excess residue, resulting in lower than expected yields and reduced protein levels.

Average winter wheat yield under irrigated condition in Huntley during 2004 was 104.1 bu/ac (Table 2). Yields ranged from 83.1 bu/ac for 'MT1159CL' to 122.3 bu/ac for 'MT00159'. 'BigSky', 'CDC Falcon', 'MT0097', 'MT01148', 'MT0177', 'Neeley', 'Paul', 'Promontory', and 'Pryor', produced yields between 107.0 bu/ac to 122.2 bu/ac, which were statistically equal with the highest yielding entry. 'BigSky' hard red winter wheat produced the heaviest test weight during 2004, averaging 64.2 lb/bu, with all of the 24 entries producing test weights heavier

than or equal to 60 lb/bu. Grain protein averaged 8.7 percent and ranged from 7.1 to 9.8 percent. Two-year average yield for winter wheat varieties tested during 2003 and 2004 averaged 113.7 bu/ac with MT00159 producing the highest average seed yield at 132.7 bu/ac. Five other entries produced yields equal to the highest yield averaged the past two years. Three-year average yield for winter wheat varieties tested during 2002 to 2004 averaged 117.9 bu/ac with Promontory producing the highest average grain yield at 128.4 bu/ac. Six other entries produced yields equal to the yields of Promontory under irrigation at this site for the past three years.

Winter wheat yields at Fly Creek averaged 45.9 bu/ac in 2004 (Table 3), and varied from 37.0 bu/ac for 'Vanguard' to 59.6 bu/ac for Pryor. 'Jerry', MT00159, MT01148, 'MTW01133' and 'Tiber', produced yields between 50.2 bu/ac to 52.9 bu/ac, which were statistically equal with the highest yielding entry. Average test weight was 60.6 lb/bu, and varied from 58.4 lb/bu for MT1159CL to 62.8 lb/bu for 'Jagalene'. Grain protein levels averaged 15.1 percent among the 24 entries, with BigSky possessing the highest protein level at 15.7 percent.

Average yield under dryland condition at Forsyth in 2004 was 32.7 bu/ac (Table 4). Grain yields ranged from 42.3 bu/ac for MT00159 to 22.3 bu/ac for 'Rampart'. Jerry, 'Morgan', MT0097, MT01148, Pryor, 'Rocky' and Tiber produced yields from 35.3 to 41.9 bu/ac, statically equal with the yields of MT00159. Average test weight was 61.2 lb/bu, with 21 out of 24 entries producing test weights heavier than 60 lb/bu. Grain protein averaged 9.0 percent and ranged from 7.9 to 10.4 percent. Two-year average yield for winter wheat varieties tested during 2003 and 2004 averaged 43.9 bu/ac with MT00159 producing the highest average seed yield at 50.6 bu/ac. Four other entries (MT0097, Promontory, Pryor and Tiber) produced yields equal to the highest yielding entry tested for the past two years. Three-year average yield for winter wheat varieties tested during 2002 to 2004 averaged 36.1 bu/ac with Rocky producing the highest average grain yield at 38.8 bu/ac. Eight other entries (CDC Falcon, 'Genou', Morgan, Neeley, NuSky, Paul, Promontory and Tiber) produced yields equal with the highest yielding entry tested for the past three years.

Agronomic performance of the winter wheat cultivars and experimental lines tested under dryland conditions near Lodge Grass during 2004 is presented in Table 5. Average grain yield was 35.3 bu/ac, down 35 percent from yield observed for this trial at this location the previous year. Highest yield was produced by Pryor at 49.9 bu/ac. Only MT0097 and Paul produced yields equal with those produced by the highest yielding entry. Average test weight was 60.2 bu/ac, with only 14 of the 24 entries producing test weights heavier than 60 lb/bu. Two-year average yield for winter wheat varieties tested during 2003 and 2004 averaged 45.3 bu/ac. Three-year average yield for winter wheat varieties tested during 2002 to 2004 in Lodge Grass averaged 45.8 bu/ac with Promontory averaging the highest yields during this three period of time.

SUMMARY:

Significant differences in yield averaged among entries under both dryland and irrigation were obtained in 2004 (Table 6). Pryor had the highest yield of 68.4 bu/ac, averaged across all four of the test locations harvested and produced the highest yield (50.4 bu/ac) among entries tested at the three harvested dryland sites. MT00159 produced yields equal with that of Pryor across all locations, and was the highest yielding entry at the Huntley irrigated location. Since 2002, experiments representing 11 location-years of testing have uniformly tested 13 cultivars at several dryland and irrigated sites in south central Montana (Table 7). Under both dryland and irrigated conditions, averaged across three years, Promontory hard red winter wheat has been the highest yielding cultivar averaging 53.9 bu/ac. Promontory also has been the highest yielding cultivar tested over three years, at 39.9 bu/ac, when comparing only dryland environments (Table 8).

FUTURE PLANS:

All five off-station winter wheat cultivar evaluations were planted during the fall of 2004 for continuation of the program through 2005. A sixth off-station winter wheat variety performance test location has been planted near Molt, replacing the wheat stem sawfly research program that has been discontinued at this site.

Table 1. Selected characteristics and traits of 24 winter wheat cultivars and breeding lines performance tested at off-station sites in south-central Montana during 2004.

Cultivar	1/ Origin	Year	2/ Market Class	3/ PVP Yes/No	4/ Maturity	5/ Coleoptile Length	Chaff Color	6/ Winter Survival 1-5	7/ Straw Strength	Solid Stem Yes/No	8/ Disease Resistance				9/ Quality		10/ Clearfield Type Yes/No
											Leaf Rust	Stem Rust	Stripe Rust	Dwarf Smut	Milling	Baking	
															1-5	1-5	
BigSky	MSU	2001	HRW	Y	M	M	White	4	S	N	S	R	S	S	4	3	N
CDC Falcon*	CDC	1999	HRW	Y	M-L	M	White	4	MS	N	R	R	-	S	3	3	N
Genou	MSU	2004	HRW	Y	M	L	White	2	MS	Y	-	-	-	S	4	4	N
Jagalene	AgriPro	2002	HRW	Y	E	M	White	2	S	N	MR	-	R	S	3	3	N
Jerry	NDSU	2001	HRW	N	M-L	M	White	5	MS	N	R	R	-	S	3	3	N
Millenium	UNL	1999	HRW	Y	E	S	White	2	M	N	MR	MR	-	S	3	3	N
Morgan	WestBred	1996	HRW	Y	M	S	White	5	MS	N	MS	MR	-	S	3	3	N
MT00159 [§]	MSU	(2005)	HRW	Y	M	S	White	3	MS	N	S	S	MR	MR	3	4	N
MT0097 [%]	MSU	(2005)	HRW	Y	M	M	White	3	M	N	S	MS	-	S	3	3	N
MT01148	MSU	-	HRW	-	M	M	White	3	S	N	-	-	-	MR	3	3	N
MT0177	MSU	-	HRW	-	M	M	White	3	MS	Y	-	-	-	S	3	3	N
MTW01133	MSU	-	HW	-	E	M	White	3	MS	N	-	-	-	S	3	3	N
MT1159CL*	MSU	2004	HRW	Y	M	M	Brown	3	S	N	-	-	-	S	3	3	Y
Neeley	UI	1980	HRW	N	M	S	White	3	MS	N	S	S	MS	S	3	3	N
NuSky	MSU	2001	HW	Y	M	S	White	4	M	N	S	R	MS	S	5	4	N
NuWest [#]	MSU	1994	HW	Y	M	S	White	4	S	N	-	R	MS	S	5	4	N
Paul	MSU	2003	HRW	Y	M	M	White	4	M	N	S	R	S	S	4	4	N
Promontory	USU	1990	HRW	N	E	M	Brown	2	MS	N	S	S	R	R	5	4	N
Pryor	WestBred	2002	HRW	Y	M-L	M	White	3	S	N	-	S	S	S	3	3	N
Rampart	MSU	1996	HRW	N	M	L	Brown	2	M	Y	S	MR	S	S	4	4	N
Rocky	AgriPro	1978	HRW	N	E	M	White	2	MW	N	-	R	S	S	3	3	N
Tiber	MSU	1988	HRW	N	M	M	Brown	3	S	N	-	S	VS	S	3	3	N
Vanguard	MSU	1995	HRW	N	M	L	White	2	MS	Y	S	S	S	S	4	4	N
Wahoo	UNL	2000	HRW	Y	E	M	White	3	S	N	MR	MR	-	S	3	2	N

1/ AgriPro=AgriPro Seeds Inc. Berthoud, Colorado; CDC=Crop Development Centre, University of Saskatchewan; MSU=Montana State University-Bozeman; NDSU=North Dakota State University; UI=University of Idaho; UNL=University of Nebraska-Lincoln; USU=Utah State University; WestBred=WestBred LLC (formerly Western Plant Breeders), Bozeman, Montana.

2/ HRW=hard red winter wheat market class; HW=hard white wheat market class.

3/ Indicates a cultivar is protected under the Federal Plant Variety Protection Act of 1970 and amended in 1995.

4/ E=early maturity, M=medium maturity, L=late maturity.

5/ L=long coleoptile length, M=medium coleoptile length, S=short coleoptile length.

6/ Winter survival rated from 1 to 5 where 1=poor and 5=best winter survival, respectively, based on years of observations at Sidney, Moccasin and Williston, North Dakota.

7/ S=strong straw strength, MS=moderately strong straw strength, M=medium straw strength, MW=moderately weak straw strength, W=weak straw strength.

8/ R=resistant, MR=moderately resistant, MS=moderately susceptible, S=susceptible, VS=very susceptible.

9/ Milling and baking quality rated from 1 to 5 where 1=poor and 5=superior quality, respectively.

10/ Signifies a cultivar possessing the Clearfield trait imparting tolerance to Beyond[®] (imazamox) herbicide.

* 'CDC Falcon' and 'MT1159CL' licensed for sale on an exclusive basis by WestBred LLC, Bozeman, Montana.

'NuWest' licensed for sale on an exclusive basis by General Mills Inc, Great Falls, Montana.

§ 'MT00159' recommended for release in 2005 by the MAES Variety Release Committee as a protected public variety. Not yet named.

% 'MT0097' recommended for release in 2005 by the MAES Variety Release Committee as a licensed variety. Not yet named.

Table 2. Performance of 24 winter wheat cultivars and experimental lines tested using conventional tillage under irrigated conditions near Huntley, Montana during 2004. Cultivars listed alphabetically. (Exp. 043880).

Cultivar	1/ Grain Yield			Test Weight	Grain Moisture	2/ Grain Protein		Plant Height	3/ Lodging	Heading Date	
	2004	2003-04	2002-04			Grain Protein	Plant Height			Julian	Calendar
	----- bushels per acre -----			lb/bu	%	%	inches	0-9			
BigSky	112.6*	116.4	121.7*	64.2	11.3	8.8	41.0	1.0	155.3	Jun 3	
CDC Falcon	107.9*	119.3*	120.7*	61.9	11.0	8.2	39.1	0.0	156.0	Jun 4	
Genou	96.8	103.7	111.8	63.2	11.4	8.4	37.3	2.0	158.7	Jun 6	
Jagalene	84.2			62.3	10.8	9.1	33.5	0.0	155.3	Jun 3	
Jerry	101.4	107.7		60.8	11.1	9.5	38.4	2.3	155.7	Jun 3	
Millenium	101.6			61.6	11.1	9.3	38.6	0.0	155.3	Jun 3	
Morgan	103.1	112.5	118.1*	62.7	10.7	8.4	40.3	0.0	155.7	Jun 3	
MT00159	122.3**	132.7**		61.4	11.2	8.4	37.7	2.0	159.7	Jun 7	
MT0097	115.4*	116.7		61.5	11.0	8.8	38.3	0.0	160.3	Jun 8	
MT01148	120.6*			62.6	11.1	8.5	39.5	0.3	155.7	Jun 3	
MT0177	106.8*			60.4	11.1	8.7	39.2	0.0	155.7	Jun 3	
MTW01133	94.1			61.5	10.6	9.0	31.5	0.0	155.3	Jun 3	
MT1159CL (MTCL01159)	83.1			59.9	10.5	9.8	33.8	0.0	159.3	Jun 7	
Neeley	119.4*	122.8*	126.4*	61.9	11.4	8.5	39.9	3.0	160.7	Jun 8	
NuSky	101.7	100.8	111.9	61.6	11.3	7.8	37.1	1.0	157.3	Jun 5	
NuWest	100.6	108.3	118.4*	61.3	11.0	7.6	37.1	1.0	157.0	Jun 5	
Paul	113.6*	123.4*	125.4*	61.8	11.0	7.8	37.3	1.7	155.7	Jun 3	
Promontory	107.0*	122.3*	128.4**	62.8	11.2	8.9	36.0	1.7	155.3	Jun 3	
Pryor	122.2*	130.9*		61.2	11.0	7.1	34.8	0.0	156.0	Jun 4	
Rampart	89.7	94.9	108.6	62.6	11.1	9.1	36.5	2.0	157.0	Jun 5	
Rocky	97.9	108.6	114.8	62.0	11.2	8.7	39.3	2.0	155.7	Jun 3	
Tiber	96.5	106.2	113.0	62.6	11.4	9.6	41.4	2.7	157.0	Jun 5	
Vanguard	101.9	106.7	113.3	62.5	11.2	9.2	39.5	0.7	156.0	Jun 4	
Wahoo	99.1			60.7	11.1	9.4	35.8	1.3	155.0	Jun 3	
Average	104.1	113.7	117.9	61.9	11.1	8.7	37.6	1.0	156.7	Jun 4	
PLSD (p=0.05)	17.4	14.4	10.8	0.4	0.4	-.	4.2	ns	1.2		
CV%	10.2	11.0	9.8	0.3	1.9	-.	6.8	169.4	0.5		

1/ Yields are based on a 60 pound standard bushel weight and adjusted to 13.0 percent moisture content.

2/ Grain protein values adjusted to 12 percent grain moisture content.

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).

** 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).

Huntley Irrigated Winter Wheat (Exp. 043880)

Planted:	October 7, 2003	Harvested:	August 6, 2004
Fertility:	11-52-00, 100 lbs/a at planting; 30-9-0, 100 lbs/a, June 3, 2004		
Herbicide:	Roundup Ultra@16 oz/a, AMS@3 lb/a, Oct 7, 2003; Bronate@16 oz/a, Harmony Extra@0.33 oz/a, R-11@16 oz/a, Apr 26, 2004		
Previous crop:	spring wheat		
Irrigation:	profile flooded, May 5, 2004; profile flooded, June 4, 2004; profile flooded, June 30, 2004		
Precipitation:	9.14 inches		

Table 3. Performance of 24 winter wheat cultivars and experimental lines tested under no-till, dryland conditions at the Fly Creek location west of Hardin, Montana during 2004. Cultivars listed alphabetically. (Exp. 043884).

Cultivar	1/	Test Weight	Grain Moisture	2/	Plant Height
	Grain Yield			Grain Protein	
	bu/ac	lb/bu	%	%	inches
BigSky	41.7	60.7	10.2	15.7	30.1
CDC Falcon	47.6	60.8	9.0	14.3	23.9
Genou	45.7	60.4	9.4	15.3	30.8
Jagalene	40.6	62.8	9.8	14.7	24.8
Jerry	50.5*	60.9	9.7	15.0	31.3
Millenium	40.6	62.3	9.8	14.7	25.0
Morgan	46.5	61.1	9.9	15.0	30.7
MT00159	51.3*	59.8	11.1	15.1	29.4
MT0097	43.3	58.9	10.1	15.5	28.7
MT01148	51.0*	60.9	10.3	15.1	28.8
MT0177	43.6	60.2	10.5	14.9	26.0
MTW01133	52.9*	61.0	9.0	15.0	24.2
MT1159CL (MTCL01159)	40.1	58.4	9.8	14.6	26.9
Neeley	47.3	58.9	9.6	15.5	28.1
NuSky	43.1	60.5	10.7	15.2	29.1
NuWest	47.9	61.0	10.2	15.3	27.5
Paul	47.6	58.9	10.1	15.0	27.0
Promontory	38.5	61.7	10.7	14.4	27.6
Pryor	59.6**	61.8	9.4	14.7	27.5
Rampart	41.6	60.8	9.6	15.6	29.8
Rocky	48.1	60.9	10.6	15.3	29.3
Tiber	50.2*	61.7	10.6	15.0	29.5
Vanguard	37.0	60.4	10.0	15.2	29.8
Wahoo	45.3	60.1	9.9	15.1	26.1
Average	45.9	60.6	10.0	15.1	28.0
PLSD (p=0.05)	10.4	0.9	0.7	-.	2.1
CV%	13.7	0.8	4.3	-.	4.5

1/ Yields are based on a 60 pound standard bushel weight and adjusted to 13.0 percent moisture content.

2/ Grain protein values adjusted to 12 percent grain moisture content.

Fly Creek Dryland Winter Wheat (Exp. 043884)

Planted:	September 30, 2003
Harvested:	July 27, 2004
Fertility:	11-52-00, 100 lbs/a at planting
Previous crop:	chemical fallow

Table 4. Performance of 24 winter wheat cultivars and experimental lines tested under conventional, dryland conditions near Forsyth, Montana during 2004. Cultivars listed alphabetically. (Exp. 043882).

Cultivar	1/ Grain Yield			Test Weight	Grain Moisture	2/ Grain Protein		Plant Height
	2004	2003-04	2002-04			%	%	
	-----bu/ac-----			lb/bu	%	%	inches	
BigSky	27.8	41.8	34.6	63.0	10.5	8.3	25.2	
CDC Falcon	31.9	42.9	36.4*	60.4	10.5	9.0	21.3	
Genou	29.8	42.4	35.4*	61.8	10.5	9.6	25.3	
Jagalene	29.0			63.3	10.5	9.1	21.3	
Jerry	35.7*	44.2		59.8	10.4	8.9	25.0	
Millenium	30.9			61.2	10.5	8.6	23.2	
Morgan	37.5*	44.4	37.1*	61.6	10.4	7.9	24.6	
MT00159	42.3**	50.6**		60.6	10.4	8.7	26.0	
MT0097	39.1*	45.6*		61.0	10.3	8.8	24.7	
MT01148	36.1*			61.0	10.4	8.6	24.0	
MT0177	27.8			60.4	10.5	9.2	24.6	
MTW01133	33.3			61.9	10.3	9.4	20.7	
MT1159CL (MTCL01159)	30.3			58.8	9.7	9.9	21.9	
Neeley	30.0	43.2	36.7*	60.2	10.3	8.8	25.4	
NuSky	32.2	45.1	37.4*	62.2	10.6	9.3	26.9	
NuWest	34.2	40.1	34.4	62.0	10.5	8.8	26.4	
Paul	32.0	43.8	37.1*	60.2	10.5	8.1	25.5	
Promontory	27.8	45.6*	37.7*	62.8	10.4	9.5	25.7	
Pryor	41.9*	50.4*		61.8	10.4	8.0	24.8	
Rampart	22.3	36.3	31.1	61.1	10.3	10.4	23.6	
Rocky	35.3*	43.0	38.8**	61.9	10.5	9.5	24.8	
Tiber	36.8*	45.5*	38.7*	61.4	10.5	8.0	27.6	
Vanguard	26.1	40.4	34.4	61.6	10.3	10.1	26.3	
Wahoo	34.4			59.1	10.4	8.5	23.7	
Average	32.7	43.9	36.1	61.2	10.4	9.0	24.5	
PLSD (p=0.05)	7.0	5.2	3.9	0.5	0.2	--	2.3	
CV%	13.1	10.2	11.5	0.5	1.0	--	5.6	

1/ Yields are based on a 60 pound standard bushel weight and adjusted to 13.0 percent moisture content.

2/ Grain protein values adjusted to 12 percent grain 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).

Forsyth Dryland Winter Wheat (Exp. 043882)

Planted: September 29, 2003
Harvested: August 2, 2004
Fertility: 11-52-00, 100 lbs/a at planting
Previous crop: summer fallow

Table 5. Performance of 24 winter wheat cultivars and experimental lines tested under no-till, dryland conditions near Lodge Grass, Montana during 2004. Cultivars listed alphabetically. (Exp. 043883).

Cultivar	1/ Grain Yield			Test Weight	Grain Moisture	2/ Grain Protein		Plant Height
	2004	2003-04	2002-04			%	%	
	-----	bushels/acre	-----	lb/bu	%	%	inches	
BigSky	27.7	39.3	41.8	59.1	6.9	13.0	30.8	
CDC Falcon	35.2	44.6	46.2	61.1	7.3	11.3	23.9	
Genou	32.5	41.0	43.0	62.0	7.0	12.0	28.9	
Jagalene	32.0			61.4	6.7	14.3	28.1	
Jerry	34.2	42.6		59.6	7.4	13.2	29.0	
Millenium	34.9			61.1	7.0	13.1	30.5	
Morgan	33.6	38.8	40.6	59.2	7.2	12.3	28.4	
MT00159	38.7	48.1		60.2	7.5	12.2	30.2	
MT0097	44.4*	52.1*		60.5	7.6	11.6	28.0	
MT01148	39.6			59.5	7.7	11.3	26.9	
MT0177	32.9			59.9	7.3	12.5	27.2	
MTW01133	40.1			61.6	7.1	12.4	28.3	
MT1159CL (MTCL01159)	26.0			57.4	6.2	13.6	27.7	
Neeley	37.4	49.0	49.8*	57.8	7.5	11.4	28.1	
NuSky	34.1	46.2	46.8*	59.9	6.9	12.7	28.4	
NuWest	32.9	40.6	43.1	59.3	7.2	12.5	29.1	
Paul	44.5*	52.0*	51.1*	60.7	7.4	10.8	28.0	
Promontory	30.0	50.4*	51.6**	60.7	7.3	12.1	26.6	
Pryor	49.9**	57.3**		61.5	7.6	10.3	26.8	
Rampart	31.1	39.8	44.1	60.6	6.7	13.9	30.2	
Rocky	27.4	41.1	45.2	59.7	7.2	13.1	26.6	
Tiber	33.6	43.4	45.0	60.1	6.9	12.9	30.9	
Vanguard	30.3	43.8	46.6	61.1	7.1	13.4	27.8	
Wahoo	43.5*			60.5	7.4	12.0	28.5	
Average	35.3	45.3	45.8	60.2	7.2	12.4	28.3	
PLSD (p=0.05)	8.3	7.2	4.8	1.2	0.5	--	3.3	
CV%	14.3	13.8	11.2	1.3	4.6	--	7.0	

1/ Yields are based on a 60 pound standard bushel weight and adjusted to 13.0 percent moisture content.

2/ Grain protein values adjusted to 12 percent grain 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).

Lodge Grass Dryland Winter Wheat (Exp. 043883)

Planted: October 10, 2003
Harvested: August 12, 2004
Fertility: 11-52-00, 100 lbs/a at planting
Previous crop: summer fallow

Table 6. Grain yield^{1/} of 24 winter wheat cultivars tested at four locations in south central Montana during 2004. Varieties listed by declining five-location average yield.

Cultivar	Forsyth Dryland	Lodge Grass Dryland	Fly Creek Dryland	bushels per acre			
				2/ Rapelje Dryland	Three Location Dryland Average	Huntley Irrigated	Four Location Average
Pryor	41.9*	49.9**	59.6**	--	50.4**	122.2*	68.4**
MT00159	42.3**	38.7	51.3*	--	44.1	122.3**	63.7*
MT01148	36.1*	39.6	51.0*	--	42.2	120.6*	61.8
MT0097	39.1*	44.4*	43.3	--	42.2	115.4*	60.5
Paul	32.0	44.5*	47.6	--	41.4	113.6*	59.4
Neeley	30.0	37.4	47.3	--	38.2	119.4*	58.5
CDC Falcon	31.9	35.2	47.6	--	38.2	107.9*	55.7
Wahoo	34.4	43.5*	45.3	--	41.1	99.1	55.6
Jerry	35.7*	34.2	50.5*	--	40.1	101.4	55.5
Morgan	37.5*	33.6	46.5	--	39.2	103.1	55.2
MTW01133	33.3	40.1	52.9*	--	42.1	94.1	55.1
Tiber	36.8*	33.6	50.2*	--	40.2	96.5	54.3
NuWest	34.2	32.9	47.9	--	38.3	100.6	53.9
MT0177	27.8	32.9	43.6	--	34.7	106.8*	52.8
NuSky	32.2	34.1	43.1	--	36.5	101.7	52.8
BigSky	27.8	27.7	41.7	--	32.4	112.6*	52.4
Rocky	35.3*	27.4	48.1	--	36.9	97.9	52.2
Millenium	30.9	34.9	40.6	--	35.5	101.6	52.0
Genou	29.8	32.5	45.7	--	36.0	96.8	51.2
Promontory	27.8	30.0	38.5	--	32.1	107.0*	50.8
Vanguard	26.1	30.3	37.0	--	31.2	101.9	48.8
Jagalene	29.0	32.0	40.6	--	33.9	84.2	46.5
Rampart	22.3	31.1	41.6	--	31.7	89.7	46.2
MT1159CL (MTCL01159)	30.3	26.0	40.1	--	32.1	83.1	44.9
Average	32.7	35.3	45.9	--	38.0	104.1	54.5
PLSD (p=0.05)	7.0	8.3	10.4	--	4.9	17.4	5.6
CV%	13.1	14.3	13.7	--	13.9	10.2	12.8

1/ Yields are based on a 60 pound standard bushel weight and adjusted to 13.0 percent moisture content.

2/ Rapelje dryland location not harvested in 2004.

** 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).

Table 7. Performance of 24 winter wheat cultivars and experimental lines tested under dryland and irrigated conditions at 4 locations in south central Montana during 2004. Cultivars listed alphabetically.

Cultivar	1/ Grain Yield			Test Weight	Grain Moisture	Grain Protein	Plant Height
	2004	2003-04	2002-04				
	----- bushels/acre -----			lb/bu	%	%	inches
BigSky	52.4	55.2	49.2	61.7	9.7	11.5	31.8
CDC Falcon	55.7	58.7	51.3*	61.1	9.5	10.7	27.1
Genou	51.2	53.9	49.3	61.8	9.6	11.3	30.6
Jagalene	46.5			62.5	9.5	11.8	26.9
Jerry	55.5	55.3		60.3	9.7	11.7	30.9
Millenium	52.0			61.6	9.6	11.4	29.3
Morgan	55.2	56.0	49.8	61.1	9.6	10.9	31.0
MT00159	63.7*	66.1*		60.5	10.1	11.1	30.8
MT0097	60.5	58.5		60.5	9.8	11.2	29.9
MT01148	61.8			61.0	9.9	10.9	29.8
MT0177	52.8			60.2	9.8	11.3	29.2
MTI01159	44.9			58.6	9.1	12.0	27.6
MTW01133	55.1			61.5	9.2	11.5	26.1
Neeley	58.5	60.1	53.4*	59.7	9.7	11.1	30.4
NuSky	52.8	54.8	51.0*	61.1	9.9	11.3	30.4
NuWest	53.9	54.4	49.9	60.9	9.7	11.1	30.0
Paul	59.4	60.6	52.3*	60.4	9.7	10.4	29.4
Promontory	50.8	61.0	53.9**	62.0	9.9	11.2	29.0
Pryor	68.4**	66.5**		61.6	9.6	10.1	28.5
Rampart	46.2	49.4	47.9	61.3	9.4	12.3	30.0
Rocky	52.2	56.3	51.3*	61.2	9.9	11.7	30.0
Tiber	54.3	57.0	51.2*	61.5	9.8	11.4	32.4
Vanguard	48.8	53.6	49.3	61.4	9.6	12.0	30.9
Wahoo	55.6			60.1	9.7	11.3	28.5
Average	54.5	57.5	50.7	61.0	9.7	11.3	29.6
PLSD (p=0.05)	5.6	4.2	3.0	0.4	0.2	0.8	1.5
CV%	12.8	13.7	12.7	0.8	3.1	5.1	6.3
Location Years	4	8	11	4	4	4	4

1/ Yields are based on a 60 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).

Table 8. Performance of 24 winter wheat cultivars and experimental lines tested under dryland conditions only in south central Montana during 2004. Cultivars listed alphabetically.

Cultivar	1/ Grain Yield			Test Weight	Grain Moisture	Grain Protein	Plant Height
	2004	2003-04	2002-04				
	----- bushels/acre -----			lb/bu	%	%	inches
BigSky	32.4	37.7	34.5	60.9	9.2	12.3	28.7
CDC Falcon	38.2	41.4	38.4*	60.8	8.9	11.5	23.0
Genou	36.0	39.7	36.6	61.4	9.0	12.3	28.3
Jagalene	33.9			62.5	9.0	12.7	24.7
Jerry	40.1	40.4		60.1	9.2	12.4	28.4
Millenium	35.5			61.5	9.1	12.1	26.2
Morgan	39.2	39.9	36.5	60.6	9.2	11.7	27.9
MT00159	44.1	47.0*		60.2	9.7	12.0	28.5
MT0097	42.2	41.9		60.1	9.3	12.0	27.2
MT01148	42.2			60.5	9.5	11.7	26.6
MT0177	34.7			60.2	9.4	12.2	25.9
MTW01133	42.1			61.5	8.8	12.3	24.4
MT1159CL (MTCL01159)	32.1			58.2	8.6	12.7	25.5
Neeley	38.2	42.2	38.8*	59.0	9.1	11.9	27.2
NuSky	36.5	41.7	37.6*	60.9	9.4	12.4	28.1
NuWest	38.3	39.1	36.0	60.8	9.3	12.2	27.7
Paul	41.4	42.7	38.4*	59.9	9.3	11.3	26.8
Promontory	32.1	43.5	39.9**	61.7	9.5	12.0	26.6
Pryor	50.4**	48.1**		61.7	9.1	11.0	26.4
Rampart	31.7	36.4	34.9	60.8	8.8	13.3	27.9
Rocky	36.9	41.3	39.1*	60.9	9.4	12.6	26.9
Tiber	40.2	42.9	39.1*	61.1	9.3	12.0	29.3
Vanguard	31.2	38.4	36.3	61.0	9.1	12.9	28.0
Wahoo	41.1			59.9	9.2	11.9	26.1
Average	38.0	41.4	37.4	60.7	9.2	12.1	26.9
PLSD (p=0.05)	4.9	3.6	2.5	0.5	0.3	1.0	1.5
CV%	13.9	14.4	13.3	0.9	3.5	5.1	5.8
Location Years	3	7	10	3	3	3	3

1/ Yields are based on a 60 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).