MONTANA STATE UNIVERSITY
MONTANA AGRICULTURAL EXPERIMENT STATION

RESULTS OF AGRONOMIC AND WEED SCIENCE RESEARCH CONDUCTED IN SOUTH CENTRAL MONTANA - 2011

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

PROJECT TITLE:

Off-Station Spring Wheat Variety Performance Trials in South Central Montana. 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 wheat varieties. This information should help spring wheat producers in south central Montana select varieties best suited to their particular area and growing conditions.

METHODS:

The 2011 off-station spring wheat trials in south central Montana were established under dryland conditions near Molt, Broadview and Huntley, and under irrigated conditions near Fromberg, Huntley and Hysham, Montana (Figure 1). The spring wheat trials for this region of Montana each possessed 25 entries made up of 24 commercial cultivars and one experimental line.

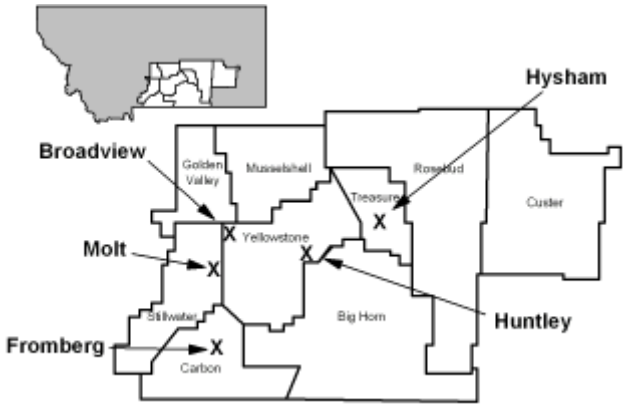

Figure 1. 2011 off-station spring wheat trial locations in south central Montana.

All studies were planted using a partially-balanced lattice design with three replications. All entries were seeded at approximately 0.75 million seeds per

acre under dryland conditions (~45 lb/a) and 1.5 million seeds per acre under irrigation (~90 lb/a). Seeding rates were not adjusted for germination. Information pertaining to the traits and characteristics of the 24 commercial spring wheat cultivars are provided in Table 1.

Test plots consisted of a 15-foot, 7-row plot with 7-inch row spacing under both irrigated and dryland conditions. 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 (bu/a) based on a 60 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 estimated using near infrared spectroscopy. Reported grain protein values are adjusted to 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 severity was recorded on a 0 to 9 scale, at Fromberg and Hysham, representing no lodging to all stems lying flat on the ground, respectively.

RESULTS:

The 2011 spring wheat test sites had near average moisture during winter months except in November with above average precipitation. Above-average precipitation occurred during April, May and July. Above average rainfall in April delayed planting at some sites. Unusually high rainfall in May (7.59 inches) resulted in higher disease incidence and nutrient deficiency due to N leaching deeper into the soil profile. Over time plants recovered as nutrients became available when the roots reached deeper with plant development. At some sites, late planting and above average precipitation during May slowed crop early development thus exposing the crop to higher temperatures during boot to heading growth stage which caused reduction in spring wheat yield particularly at the dryland sites. Harvest was delayed at most sites this year.

The average dryland spring wheat yield near Huntley in 2011 was 54 bu/a (Table 2), 17 bushels less per acre than the trial harvested the previous year. Yields ranged from 42 bu/a for 'McNeal' to 63 bu/a for 'AP604 CL' and 'Jerome'. Commercial cultivars 'Duclair' and 'Vida' produced yield of 59 and 62 bu/a respectively, statistically equal to that of highest yielding cultivars at Huntley. Test weight averaged 57.5 lb/bu, with all entries having test weights lower than 60 lb/bu. Grain protein averaged 18 percent and varied from 16.2 percent for 'Duclair' to 19.6 percent for 'Solano'. 'Vida' has been the highest yielding entry tested at this location the past three years, averaging 67 bu/a. Seven other commercial entries including 'AP604 CL, 'Choteau', 'Corbin', 'Hank', Jerome, 'Oneal' and 'Traverse' have produced yields from 61 to 67 bu/a the past three years, equal to the yield of Vida.

Dryland spring wheat yields at Broadview averaged only 18 bu/a in 2011, less than half what was harvested the previous year (Table 3). Lower yield was mainly attributed to delayed planting and lack of good stand establishment. Some stem cutting by the wheat stem sawfly (Cephus cinctus Norton) was observed at Broadview in 2011. 'Choteau', 'Mott' and 'WB Gunnison' showed little or no stem cutting, while 'Hank', 'Kuntz,' 'Reeder', and 'Volt' suffered higher stem cutting. Spring wheat test weights averaged 60.1 lb/bu and ranged from 57.6 lb/bu for 'Hank' to 62.7 for 'Volt'. Thirteen entries produced test weights greater than 60 lb/bu. Grain protein levels were excellent and averaged 17.2 percent, varying from 15.9 percent for 'Kuntz' to 19 for 'Fortuna'. The average plant height at Broadview was 25 inches.

Molt spring wheat yields averaged only 15 bu/a in 2011 (Table 4), which was less than half the average spring wheat yields experienced at this site in 2010. Yield was not significantly different among entries in 2011 at Molt and ranged from 10 bu/a to 18 bu/a. Average test weight was 60.9 lb/bu. Test weight varied from

59.0 lb/bu for ‘McNeal’ and Solano to 63.3 lb/bu for ‘SY Tyra’ spring wheat. Most entries had test weight heavier than 60 lb/bu at Molt. Grain protein levels averaged 16.5 percent. Grain protein levels varied from 14.3 percent for ‘Kuntz’ to 17.7 percent for ‘McNeal’. Three-year average yield for spring wheat varieties tested during 2009, 2010 and 2011 at Molt averaged 25 bu/a.

Irrigated spring wheat yields were depressed due to late planting at Huntley and averaged only 65 bu/a. Grain yield varied from 55 bu/a for ‘McNeal’ to 80 bu/a for ‘Duclair’ followed by ‘Jerome’ at 75 bu/a (Table 5). Commercial entry ‘Fortuna’ exhibited highest level of lodging (7.3 score) fallowed by ‘Superb’ and ‘Solana’. Average test weight was 59 lb/bu, with eight of the spring wheat entries having test weights greater than 60 lb/bu. Grain protein levels were high and averaged 17.4 percent in 2011, much higher than the protein levels observed the previous year. Protein content varied from 15.6 for ‘McNeal’ to 20.3 percent for ‘Solano’. ‘Jerome’ spring wheat has also been the highest yielding cultivar tested under irrigation at Huntley the past 2 and 3 years, averaging 96 and 89 bu/a, respectively.

Little or no lodging was observed for most commercial cultivars under irrigation at Hysham in 2011 compared to previous years mainly because no irrigation was applied at milk or soft dough growth stage due to above average rain in July. Only the tall cultivars namely ‘Fortuna’, ‘Solano’ and ‘Superb’ suffered some lodging (Table 6). Average yield at Hysham was 82.5 bu/a about 11 bu/a higher than last year. Yields ranged from 65 bu/a for ‘Superb’ to 98 bu/a for ‘Volt’. Six other commercial entries namely ‘Corbin’, ‘Duclair’, ‘McNeal’, ‘Mott’, ‘Oneal’, and ‘Traverse’ produced an average yield statistically equal to the yield of ‘Volt’. Average test weight was 62.5 lb/bu, with all entries having test weights greater than 60 lb/bu except ‘Solano’. Grain protein levels averaged 16.4 percent and varied from 14.2 percent for ‘Volt’ to 18.6 percent for ‘Kelby’. ‘Jerome’ spring wheat has been the highest yielding cultivar tested under irrigation at Hysham the past three years, averaging 96 bu/a. Twelve other entries produced yields equal to ‘Jerome’ averaged over the past three years (Table 6).

At Fromberg in 2011 most of the spring wheat entries exhibited limited or no lodging under irrigation (Table 8). The tall cultivars, namely ‘Fortuna’, ‘Solano’ and ‘Superb’ were the exceptions and suffered some lodging. Spring wheat benefitted from early planting at Fromberg that resulted in higher yield. The yield was the highest among all the locations tested in 2011 averaging 102 bu/a. Yields ranged from 81 bu/a for ‘Superb’ to 126 bu/a for ‘Volt’. ‘Kuntz’ was the only commercial cultivar that produced average yield of 116 bu/a statistically equal to the yield of ‘Volt’. Average test weight was 62.5 lb/bu, varied from 58.3 lb/bu for ‘AC Lillian’ to 64.2 lb/bu for ‘Volt’. Twenty-two entries had test weights greater than 60 lb/bu. Grain protein levels were excellent averaging 16.4 percent with all entries exceeding protein contents of 13 percent. Yield variations have been evident at Fromberg for spring wheat entries tested over the past two and three years mainly due to the diverse environmental conditions. Two and three year averaged yield, for spring wheat varieties tested during 2009 - 2011, was 96 and 102 bu/a respectively.

SUMMARY:

Unusually higher than normal precipitation during spring caused delayed planting at most locations in 2011. Delayed planting coupled with continued heavy precipitation in May not only slowed wheat early growth but also increased disease incidence. Plant maturity and harvest was also delayed. All these factors ultimately adversely affected the spring wheat grain yield particularly at dryland sites. In 2011 'Volt' hard red spring wheat was the highest yielding entry under irrigation and across all locations tested in south central Montana (Tables 9 and 10), averaging 96 and 63 bu/a respectively. 'Vida' was the highest yielding cultivar under dryland conditions in 2011 as well as over the past two and three years (Table 8 and 11). Long-term yield based on last two and three years average across all location was highest for 'Traverse' and 'Jerome' respectively (Table 9). Across all locations for the past three years, only 'AP604 CL', 'Choteau', 'Hank', 'Oneal', and 'Volt' produced yields ranged from 66 to 70 bu/a, which was statistically equal to the yield of 'Jerome' during the same period of testing (Table 9). After three year of testing in south central Montana, the Clearfield cultivar 'AP604 CL' has shown promise of good yield potential across both dryland and irrigated environments. In 2011 grain yield at most location was lower compared to past years but the protein levels were excellent ranging from 14-17 percent across locations. Averaged across locations grain protein content was averaging 16.6 percent (Table 9) with all cultivars exceeding protein content levels of 13 percent. Overall test weight was good averaging 60.3 lb/bu across locations (Table 9).

Table 1. Selected characteristics and traits of 24 commercial spring wheat cultivars performance tested at six off-station sites in south central Montana during 2011.

							6/ Disease Resistance					6/ Insect Resistance		7/ Quality		8/
Cultivar	1/ Origin	Year of Release	2/ Market Class	3/ PVP	4/ Maturity	5/ Straw Strength	Fusarium Head Blight (Scab)	Leaf Rust	Stem Rust	Stripe Rust	Wheat Stem Sawfly	Russian Wheat Aphid	Hessian Fly (GP)	Milling	Baking	Clearfield Type
				Yes/No										1-5	1-5	Yes/No
AC Lillian	AAFC	2003	HRS	-	-	-	S	MR	-	-	R	-	-	-	-	N
AP604 CL	AgriPro	2009	HRS	Y	M	S	MS	MS	MR	-	S	S	-	4	4	Y
Choteau	MSU	2003	HRS	Y	E-M	VS	S	-	R	S	R	S	S	4	4	N
Conan	WestBred	1997	HRS	Y	E	S	S	R	-	R	MS	S	S	3	3	N
Corbin	WestBred	2006	HRS	Y	E	MS	S	-	-	R	R	S	-	3	3	N
Duclair	MSU	2011	HRS	Y	E-M	S	-	-	MR	MR	-	-	-	-	-	N
Fortuna	NDSU	1966	HRS	N	E	MW	S	R	R	VS	R	S	S	5	4	N
Freyr	AgriPro	2004	HRS	Y	M	M	MR	MR	MR	MR	S	S	S	3	3	N
Hank	WestBred	1999	HRS	Y	E	S	S	R	R	MR	S	S	R	3	4	N
Jedd	WestBred	2008	HRS	Y	E-M	S	S	-	-	MS	S	S	R	3	3	Y
Jerome	UI	2004	HRS	Y	M	S	S	-	-	R	S	S	R	4	5	N
Kelby	AgriPro	2006	HRS	Y	M	MS	MR	MR	R	-	S	S	-	3	3	N
Kuntz	AgriPro	2007	HRS	Y	M	S	MR	MR	R	-	S	S	-	3	4	N
McNeal	MSU	1995	HRS	N	M	S	S	MS	MR	VS	S	S	S	3	5	N
Mott	NDSU	2009	HRS	Y	M-L	-	S	MS	MR	-	R	-	-	4	4	N
Oneal	WestBred	2008	HRS	Y	M	S	S	-	-	S	MS	S	-	3	3	N
Outlook	MSU	2003	HRS	Y	M-L	S	S	MR	R	S	S	R	S	3	3	N
Reeder	NDSU	1999	HRS	Y	M-L	S	MS	MR	R	MR	S	S	S	3	3	N
Solano	WestBred	2007	HRS	Y	-	-	-	MR	MR	MR	-	-	-	-	-	N
Superb	AAFC	2001	HRS	-	M-L	S	S	MS	R	-	S	S	-	-	-	N
SY Tyra	Syngenta	2011	HRS	Y	M	M	S	R	R	MR	MR	-	-	-	-	N
Traverse	SDSU	2006	HRS	Y	E-M	M	MR	MR	R	MR	S	S	-	1	1	N
Vida	MSU	2006	HRS	Y	M-L	S	S	-	MS	MR	MS	S	S	4	4	N
Volt	WestBred	2008	HRS	Y	M	S	MR	-	-	R	S	S	-	3	3	N

1/ AAFC=Agriculture & Agri-Food Canada; AgriPro=AgriPro COKER, Berthoud, Colorado; MSU=Montana State University; NDSU=North Dakota State University; SDSU=South Dakota State University; UI=University of Idaho; WestBred=WestBred Group, Monsanto Co., Bozeman, Montana.

2/ HRS=hard red spring 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/ S=strong straw strength, MS=moderately strong straw strength, M=medium straw strength, MW=moderately weak straw strength, W=weak straw strength.

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

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

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

Table 2. Performance of 25 spring wheat cultivars tested under no-till, dryland conditions near Huntley, Montana during 2011. Cultivars listed alphabetically. (Exp. 109908).

Cultivar	Grain Yield 1/ 2011	Grain Yield 1/ 2010-11	Grain Yield 1/ 2009-11	Test Weight	Grain Moisture	Grain Protein 2/	Plant Height	Lodging
	------- bushels/acre -------			lb/bu	%	%	inches	0-9
Commercial								
AC Lillian	56.4	58.4	54.6	56.1	10.4	18.1	32.2	0.0
AP604 CL	**63.3****	**66.5***	**63.0***	59.8	10.9	16.8	38.5	0.0
Choteau	55.3	**63.3***	**60.6***	58.3	10.7	17.1	32.3	0.0
Conan	49.7	57.3	51.9	58.8	10.5	18.0	31.1	0.0
Corbin	54.5	**65.5***	**61.9***	57.3	10.4	17.8	35.5	0.0
Duclair	**59.1***	**67.8***		57.8	10.6	16.2	35.1	0.0
Fortuna	52.8	59.9	55.5	58.8	10.8	17.7	41.1	4.0
Hank	54.9	**65.6***	**63.4***	56.3	10.4	17.8	30.5	0.0
Jedd	52.3	**60.7**	58.5	56.8	10.5	17.6	29.1	0.1
Jerome	**63.3****	**69.9****	**66.8***	56.9	10.6	17.2	35.5	0.0
Kelby	52.8	56.6	51.3	59.7	10.8	17.8	30.9	0.0
Kuntz	55.0	**63.4***	59.9	56.8	10.5	16.5	31.9	0.0
McNeal	41.8	54.6	55.0	56.4	10.4	16.8	31.0	0.0
Mott	50.0	**56.6**		58.2	10.5	18.4	35.9	0.1
Oneal	51.9	**63.5***	**61.8***	57.7	10.7	17.5	33.6	0.0
Outlook	53.9	**62.4***	59.9	55.3	10.1	17.6	32.6	0.0
Reeder	53.4	**62.8***	60.2	58.0	10.5	17.5	33.0	0.0
Solano	52.3	**62.9***		57.2	10.4	19.6	40.5	0.0
Superb	53.0	**62.3***	57.0	58.7	10.9	17.9	42.8	4.1
SY Tyra	48.2			54.8	10.4	17.7	29.3	0.0
Traverse	52.6	**65.1***	**62.0***	56.4	10.2	17.2	33.7	0.0
Vida	**61.5***	**68.4***	**67.1****	56.6	10.5	17.8	35.4	0.1
Volt	58.2	**66.3***	60.2	59.3	10.7	17.6	32.9	0.0
WB Gunnison	51.9			57.7	10.7	18.4	31.2	0.0
Experimental								
IMICHT79	**60.0***			57.6	10.6	17.2	32.7	0.0
Average	54.3	62.7	59.5	57.5	10.5	17.6	33.9	0.3
PLSD (p=0.05)	4.7	8.3	6.7	1.6	0.3	1.1	2.5	0.6
CV%	5.2	6.3	6.2	1.5	1.9	3.7	4.4	120.2

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

Huntley Dryland Spring Wheat (Exp. 119908)

Planted:	April 12, 2011
Harvested:	August 20, 2011
Fertility:	75-40-0, preplant, April 6, 2011
Herbicide:	n/a
Insecticide:	none applied
Previous Crop:	chemical fallow
Precipitation:	14.4 inches

Table 3. Performance of 25 spring wheat cultivars tested under no-till, dryland conditions near Broadview, Montana during 2011. Cultivars listed alphabetically. (Exp. 119995).

Cultivar	Grain Yield 1/ 2011	Grain Yield 1/ 2010-11	Grain Yield 1/ 2009-11	Test Weight	Grain Moisture	Grain Protein 2/	Plant Height
	------- bushels/acre -------			lb/bu	%	%	inches
Commercial							
AC Lillian	20.0	28.2	28.3	59.2	9.4	16.2	23.3
AP604 CL	21.5	27.3	28.4	61.6	9.2	16.6	27.9
Choteau	20.8	29.6	**30.3***	60.2	9.2	17.7	23.9
Conan	20.5	28.7	**29.2***	58.6	9.4	18.1	24.7
Corbin	12.2	24.0	26.6	58.8	9.4	17.1	24.8
Duclair	16.6	31.3		59.9	9.0	18.1	23.5
Fortuna	13.2	23.4	24.7	60.2	9.2	19.0	28.8
Hank	15.8	27.5	27.8	57.6	8.9	17.7	25.3
Jedd	15.0	24.0	26.3	60.9	9.6	15.9	22.1
Jerome	24.3	30.7	**30.3***	59.3	9.2	16.1	26.1
Kelby	16.5	24.4	24.7	60.7	9.2	17.7	22.8
Kuntz	13.8	24.1	25.3	61.3	9.6	15.6	24.3
McNeal	14.6	23.6	25.2	58.9	9.6	18.5	25.9
Mott	20.9	28.3		61.4	9.1	18.1	26.3
Oneal	15.4	29.9	**30.6***	59.8	9.8	17.3	25.1
Outlook	17.9	24.2	26.3	59.2	9.1	17.0	25.3
Reeder	16.3	26.8	28.2	60.5	9.1	16.7	24.1
Solano	18.0	25.7		59.0	9.0	17.8	27.8
Superb	18.5	27.8	**29.2***	60.7	9.2	18.3	30.2
SY Tyra	17.0			61.2	9.3	16.4	22.6
Traverse	21.9	28.2	28.1	58.9	9.0	17.4	25.6
Vida	27.1	33.8	**33.2****	60.6	9.4	15.9	26.2
Volt	16.5	25.4	26.1	62.7	9.6	16.1	24.8
WB Gunnison	12.4			60.7	9.5	16.4	22.8
Experimental							
IMICHT79	14.3			60.5	9.1	18.9	21.9
Average	17.6	27.1	27.8	60.1	9.3	17.2	25.0
PLSD (p=0.05)	ns	ns	4.7	1.9	0.4	1.6	2.4
CV%	33.5	24.0	17.5	1.9	2.5	5.8	5.4

1/ Yields are based on 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).

Broadview Dryland Spring Wheat (Exp. 119995)	
Planted:	April 28, 2011
Harvested:	August 31, 2011
Fertility:	46-0-0, 30 lb /a, June 21, 2011
Herbicide:	5 oz Turret LD6, + 3 oz Clarity; Roundup RT3, 22 oz./a, April 27, 2011
Insecticide:	none applied
Previous Crop:	fallow
Precipitation:	n/a

Table 4. Performance of 25 spring wheat cultivars tested under conventional dryland conditions near Molt, Montana during 2011. Cultivars listed alphabetically. (Exp. 119994).

Cultivar	Grain Yield 1/ 2011	Grain Yield 1/ 2010-11	Grain Yield 1/ 2009-11	Test Weight	Grain Moisture	Grain Protein 2/	Plant Height
	------- bushels/acre -------			lb/bu	%	%	inches
Commercial							
AC Lillian	16.0	24.6	24.5	60.6	8.9	16.1	17.5
AP604 CL	14.6	25.1	26.7	62.1	9.1	17.3	17.2
Choteau	15.1	27.0	25.3	60.8	9.0	16.5	15.7
Conan	12.2	23.6	24.1	62.0	9.1	17.6	18.9
Corbin	13.3	23.9	24.3	61.6	9.1	18.2	18.9
Duclair	16.2	28.6		60.0	9.1	15.5	16.1
Fortuna	11.9	24.3	23.7	59.3	8.9	18.8	19.0
Hank	14.1	27.2	27.9	60.7	9.0	16.4	15.9
Jedd	11.9	22.1	24.2	62.3	9.2	16.5	13.5
Jerome	13.9	26.1	25.0	60.0	9.2	16.3	14.7
Kelby	10.3	23.4	22.7	60.8	8.7	19.6	13.9
Kuntz	13.8	23.8	22.9	61.6	9.1	15.6	16.4
McNeal	17.3	23.9	23.4	59.0	8.7	16.1	18.4
Mott	16.9	25.2		62.1	9.4	15.6	16.1
Oneal	15.1	26.8	27.8	59.9	9.4	14.5	16.9
Outlook	15.6	29.5	28.5	60.2	8.9	15.7	17.2
Reeder	16.2	26.1	27.1	62.4	9.3	14.7	15.9
Solano	14.1	25.5		59.0	8.8	18.1	14.8
Superb	12.8	23.9	25.4	59.8	9.1	17.5	18.2
SY Tyra	16.2			63.3	9.5	14.8	15.2
Traverse	16.1	26.7	26.0	60.4	8.9	15.3	16.3
Vida	18.0	28.1	28.5	61.4	9.5	13.5	17.3
Volt	13.8	24.6	25.1	62.4	9.2	17.3	15.7
WB Gunnison	11.3			60.0	9.2	17.7	15.4
Experimental							
IMICHT79	18.0			60.6	8.9	17.3	14.7
Average	14.6	25.5	25.4	60.9	9.1	16.5	16.4
PLSD (p=0.05)	ns	ns	ns	1.3	0.2	1.5	3.3
CV%	19.3	19.0	18.7	1.3	1.4	5.2	12.1

1/ Yields are based on 60 pound standard bushel weight and adjusted to 13.0 percent moisture content.
2/ Grain protein values adjusted to 12 percent grain moisture content.
ns Indicates no significant difference between cultivars within a column based on Fisher's protected LSD (p=0.05).

Molt Dryland Spring Wheat (Exp. 119994)	
Planted:	May 3, 2011
Harvested:	September 6, 2011
Fertility:	46-0-0, 60 lb/a, June 15, 2011
Herbicide:	none applied
Insecticide:	none applied
Previous Crop:	fallow
Precipitation:	n/a

Table 5. Performance of 25 spring wheat cultivars tested under irrigation near Huntley, Montana during 2011. Cultivars listed alphabetically. (Exp. 119909).

	1/ Grain Yield			Test	Grain	2/ Grain	Plant		Heading Date	
Cultivar	**2011**	**2010-11**	**2009-11**	**Weight**	**Moisture**	**protein**	**Height**	**Lodging**	**Julian**	**Calendar**
	------- bushels/acre -------			lb/bu	%	%	inches	0-9		
Commercial										
AC Lillian	56.2	61.6	70.7	58.0	8.8	17.2	32.3	0.0	180.7	Jun 29
AP604 CL	65.5	**79.8***	**88.6***	61.9	9.2	16.1	34.5	0.0	179.3	Jun 28
Choteau	69.6	**80.7***	**89.7***	60.6	8.9	17.0	32.3	2.0	182.0	Jul 1
Conan	62.3	75.8	81.5	59.1	9.1	18.5	33.5	0.0	181.7	Jun 30
Corbin	65.7	71.8	81.2	57.2	9.0	18.0	34.5	1.0	182.0	Jul 1
Duclair	**79.9****	**85.7***		58.3	8.8	16.5	34.8	0.3	179.3	Jun 28
Fortuna	55.5	64.7	71.1	58.0	8.7	18.8	41.9	7.3	182.7	Jul 1
Hank	71.2	**88.2***	**94.5***	55.4	8.4	18.0	33.4	1.3	181.0	Jun 30
Jedd	68.8	**81.6***	**88.2***	58.3	8.8	16.9	30.7	0.0	180.7	Jun 29
Jerome	**75.1***	**89.2****	**96.3****	60.5	8.9	16.5	34.3	0.0	179.7	Jun 28
Kelby	60.6	75.6	78.7	60.3	8.8	18.5	29.0	0.3	179.7	Jun 28
Kuntz	65.0	**79.3***	85.0	60.7	8.9	16.1	31.0	0.0	182.3	Jul 1
McNeal	55.1	73.1	74.0	58.3	8.9	15.6	34.1	0.0	183.0	Jul 2
Mott	57.9	73.5		60.1	8.9	16.8	36.1	0.0	183.3	Jul 2
Oneal	64.4	76.1	86.9	57.2	8.7	17.1	35.1	0.0	182.7	Jul 1
Outlook	67.8	**79.1***	86.6	59.2	8.7	16.3	35.2	0.0	184.3	Jul 3
Reeder	65.9	**78.5***	86.5	60.7	8.8	17.6	35.1	0.7	181.3	Jun 30
Solano	61.0	**79.1***		57.4	8.5	20.3	41.0	4.0	182.7	Jul 1
Superb	57.5	74.1	82.5	57.5	8.7	18.9	40.9	6.7	181.3	Jun 30
SY Tyra	67.7			59.5	9.2	16.5	31.1	0.0	182.3	Jul 1
Traverse	66.3	**82.2***	**90.4***	58.7	8.6	17.1	34.1	0.0	183.3	Jul 2
Vida	64.1	74.8	84.9	58.1	9.0	17.5	34.7	0.0	182.7	Jul 1
Volt	66.0	**83.2***	**90.7***	60.4	9.0	17.3	32.1	0.0	186.0	Jul 5
WB Gunnison	67.5			60.6	9.2	17.0	30.6	0.0	183.3	Jul 2
Experimental										
IMICHT79	70.5			58.8	8.5	18.4	36.6	0.0	183.0	Jul 2
Average	65.1	77.6	84.6	59.0	8.8	17.4	34.4	0.9	182.0	Jul 1
PLSD (p=0.05)	8.1	11.2	9.0	1.8	0.3	1.0	2.8	1.7	1.2	
CV%	7.5	12.1	11.1	1.7	2.3	3.6	4.9	113.0	0.4	

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

Table 6 Continued.

Huntley Irrigated Spring Wheat (Exp. 119909)

Planted:	May 3, 2011
Harvested:	August 29, 2011
Fertility:	100-40-0, spread on November 3, 2010
Herbicide:	n/a
Insecticide:	none
Previous Crop:	sugarbeets
Irrigation:	profile flooded:
Precipitation:	12.1 inches

Table 6. Performance of 25 spring wheat cultivars tested under irrigation near Hysham during 2011. Cultivars listed alphabetically. (Exp. 119996).

Cultivar	Grain Yield 1/ 2011	Grain Yield 1/ 2010-11	Grain Yield 1/ 2009-11	Test Weight	Grain Moisture	Grain Protein 2/	Plant Height	Lodging
	------- bushels/acre -------			lb/bu	%	%	inches	0-9
Commercial								
AC Lillian	80.1	72.5	71.8	62.3	10.8	16.4	35.4	0.0
AP604 CL	84.3	82.4	**88.6***	63.6	11.1	15.2	37.1	0.0
Choteau	78.1	78.5	**86.6**	63.1	11.1	15.5	34.8	0.0
Conan	72.5	75.7	**80.5***	62.6	11.3	17.5	33.6	0.0
Corbin	**90.8***	79.0	78.3	62.8	10.7	17.0	37.5	0.0
Duclair	**87.9***	82.3		62.1	10.8	16.0	36.7	0.0
Fortuna	72.9	68.7	71.4	61.0	10.5	17.5	44.2	6.7
Hank	84.8	78.0	**92.0***	61.0	10.5	17.0	34.5	0.0
Jedd	75.6	82.9	**91.1***	62.9	10.6	16.9	31.2	0.0
Jerome	83.8	77.1	**95.8****	62.1	10.9	15.4	35.4	0.0
Kelby	70.5	73.4	**80.4***	62.6	10.6	18.6	32.5	0.0
Kuntz	84.0	76.7	**86.9***	64.0	10.8	16.2	33.7	0.0
McNeal	**90.0***	84.6	**93.9***	62.9	10.7	15.9	38.2	0.0
Mott	**92.8***	81.4		63.2	10.9	15.3	39.5	0.0
Oneal	**89.5***	79.4	**86.5***	62.2	10.8	16.1	37.3	0.0
Outlook	85.9	73.9	**82.1***	62.3	10.9	17.0	39.0	1.0
Reeder	74.9	68.8	70.5	64.3	10.7	16.6	35.8	0.0
Solano	73.5	76.4		59.1	9.9	18.3	41.6	4.3
Superb	65.1	59.0	66.3	59.9	10.4	16.8	44.1	7.7
SY Tyra	83.0			63.9	11.2	15.4	32.2	0.0
Traverse	**90.8***	84.6	**91.3***	62.3	10.9	16.3	38.5	0.0
Vida	85.1	77.1	77.8	62.5	11.4	16.4	37.0	0.0
Volt	**98.0****	86.2	**93.1***	64.6	11.1	14.2	35.8	0.0
WB Gunnison	82.7			63.0	11.4	17.8	33.6	0.0
Experimental								
IMICHT79	**87.1***			62.6	10.7	15.7	36.7	0.0
Average	82.5	77.2	83.4	62.5	10.8	16.4	36.6	0.8
PLSD (p=0.05)	12.0	ns	16.3	1.2	0.5	1.9	1.9	1.4
CV%	8.8	15.6	20.5	1.2	2.6	7.0	2.8	109.8

1/ Yields are based on 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.
** 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).

Hysham Irrigated Spring Wheat (Exp. 119996)

Planted:	April 29, 2011
Harvested:	August 15, 2011
Fertility:	60 lb N/a preplant, 67 lb/a 11-52-0 at planting; 140 lb N/a top dress, May, 2011
Herbicide:	none
Previous Crop:	n/a
Irrigation:	flood
Precipitation:	n/a

Table 7. Performance of 25 spring wheat cultivars tested under irrigation near Fromberg, Montana during 2011. Cultivars listed alphabetically. (Exp. 119997).

Cultivar	Grain Yield 1/ 2011	Grain Yield 1/ 2010-11	Grain Yield 1/ 2009-11	Test Weight	Grain Moisture	Grain Protein 2/	Plant Height	Lodging
	------- bushels/acre -------			lb/bu	%	%	inches	0-9
Commercial								
AC Lillian	97.4	89.5	93.2	58.3	12.0	14.4	36.8	0.0
AP604 CL	107.2	99.9	102.1	63.7	12.8	13.4	43.5	3.3
Choteau	106.8	96.3	101.7	62.7	12.4	13.9	39.0	0.0
Conan	105.0	90.6	95.5	61.5	12.5	14.5	38.7	0.0
Corbin	111.8	97.8	100.1	62.6	12.6	14.6	42.0	0.0
Duclair	97.9	97.7		62.2	12.0	13.8	40.8	0.7
Fortuna	90.5	89.3	93.3	62.4	12.1	15.3	45.5	6.0
Hank	97.3	106.5	111.4	58.4	11.9	14.0	38.1	0.0
Jedd	91.0	90.9	98.3	59.8	12.0	14.6	35.1	1.7
Jerome	112.2	100.3	106.0	62.3	12.7	13.7	40.8	0.0
Kelby	111.4	99.0	96.9	63.7	12.2	15.3	38.4	0.0
Kuntz	**116.0***	102.0	106.0	62.4	11.8	14.3	37.2	0.0
McNeal	88.2	84.9	96.2	60.5	11.4	13.6	39.6	0.0
Mott	100.4	88.7		61.6	13.1	14.0	43.9	0.0
Oneal	93.4	97.7	108.6	60.2	12.4	14.0	40.2	0.0
Outlook	106.4	98.8	106.4	60.8	12.5	13.3	39.6	0.0
Reeder	104.3	89.8	98.7	62.1	12.7	14.1	42.7	0.0
Solano	85.4	93.3		61.2	12.1	17.2	45.4	5.7
Superb	80.5	92.5	99.4	62.1	12.6	15.9	46.6	7.3
SY Tyra	97.2			61.3	12.6	13.6	33.7	0.0
Traverse	110.0	107.3	113.2	61.7	12.6	13.3	40.4	0.0
Vida	106.9	92.2	100.8	61.0	13.4	14.1	40.3	1.3
Volt	**124.6****	106.7	111.2	64.2	12.6	13.8	38.3	0.0
WB Gunnison	108.7			61.8	12.6	14.5	34.8	0.0
Experimental								
IMICHT79	102.2			62.3	12.5	14.0	39.2	0.0
Average	102.1	96.0	102.1	61.6	12.4	14.3	40.0	1.0
PLSD (p=0.05)	9.5	ns	ns	0.9	0.8	0.8	2.3	1.7
CV%	5.2	21.8	17.0	0.8	3.9	3.3	3.4	100.4

1/ Yields are based on 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.
** 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).

Fromberg Irrigated Spring Wheat (Exp. 109997)

Planted:	March 21,, 2011
Harvested:	August 10, 2011
Fertility:	100 lb N/a preplant; 67 lb/a 11-52-0 at planting; 120 lb N/a top dress in May, 2011
Herbicide:	n/a
Previous Crop:	corn
Irrigation:	flood
Precipitation:	n/a

Table 8. Grain yield[1/] of 25 spring wheat cultivars tested at six locations in south central Montana during 2011. Varieties listed by declining six-location average yield.

	Dryland				Irrigated				Six Location
	Huntley	Molt	Broadview	Ave.	Huntley	Hysham	Fromberg	Ave.	Average
	bushels/acre								
Volt	58.2	13.8	16.5	29.7	66.0	**98.0****	**124.6****	**96.0****	**62.9****
Jerome	**63.3****	13.9	24.3	**34.6***	**75.1***	83.8	112.2	**90.0***	**62.3***
Vida	**61.5***	18.0	27.1	**35.9****	64.1	85.1	106.9	**85.5***	**60.7***
Traverse	52.6	16.1	21.9	**30.6***	66.3	**90.8***	110.0	**89.9***	**60.2***
AP604 CL	**63.3****	14.6	21.5	**33.3***	65.5	84.3	107.2	**85.8***	**59.6***
Duclair	**59.1***	16.2	16.6	**30.7***	**79.9****	**87.9***	97.9	**87.5***	**59.1***
Corbin	54.5	13.3	12.2	27.2	65.7	**90.8***	111.8	**89.6***	**58.4***
IMICHT79	**60.0***	18.0	14.3	30.2	70.5	**87.1***	102.2	**86.4***	**58.3***
Kuntz	55.0	13.8	13.8	27.6	65.0	84.0	**116.0***	**88.5***	**58.1***
Outlook	53.9	15.6	17.9	28.3	67.8	85.9	106.4	**86.8***	**57.6***
Choteau	55.3	15.1	20.8	29.7	69.6	78.1	106.8	84.5	**57.1***
Hank	54.9	14.1	15.8	28.6	71.2	84.8	97.3	**84.8***	**56.7***
Mott	50.0	16.9	20.9	28.6	57.9	**92.8***	100.4	83.5	**56.1***
Oneal	51.9	15.1	15.4	28.0	64.4	**89.5***	93.4	82.4	**55.2***
WB Gunnison	51.9	11.3	12.4	24.6	67.5	82.7	108.7	**85.7***	**55.2***
Reeder	53.4	16.2	16.3	27.8	65.9	74.9	104.3	82.0	**54.9***
AC Lillian	56.4	16.0	20.0	**31.3***	56.2	80.1	97.4	78.3	**54.8***
SY Tyra	48.2	16.2	17.0	26.7	67.7	83.0	97.2	82.2	**54.5***
Kelby	52.8	10.3	16.5	26.9	60.6	70.5	111.4	81.2	54.0
Conan	49.7	12.2	20.5	28.2	62.3	72.5	105.0	79.8	54.0
Jedd	52.3	11.9	15.0	26.4	68.8	75.6	91.0	79.2	52.8
Solano	52.3	14.1	18.0	28.5	61.0	73.5	85.4	73.8	51.1
McNeal	41.8	17.3	14.6	24.2	55.1	**90.0***	88.2	77.0	50.6
Fortuna	52.8	11.9	13.2	24.9	55.5	72.9	90.5	72.6	48.8
Superb	53.0	12.8	18.5	28.6	57.5	65.1	80.5	68.1	48.3
Average	54.3	14.6	17.6	28.9	65.1	82.5	102.1	83.2	56.0
PLSD (p=0.05)	4.7	ns	ns	5.4	8.1	12.0	9.5	11.2	6.5
CV%	5.2	19.3	33.5	19.6	7.5	8.8	5.2	14.1	17.6

1/ Yields are based on 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).

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

Table 9. Performance of 25 spring wheat cultivars tested under both dryland and irrigated conditions at six locations in south central Montana during 2011. Cultivars listed alphabetically.

Cultivar	Grain Yield 1/ 2011	Grain Yield 1/ 2010-11	Grain Yield 1/ 2009-11	Test Weight	Grain Moisture	Grain Protein 2/	Plant Height
	------- bushels/acre -------			lb/bu	%	%	inches
Commercial							
AC Lillian	**54.8***	55.8	57.2	59.1	10.0	16.4	29.8
AP604 CL	**59.6***	**63.5***	**66.2***	62.1	10.4	15.9	33.2
Choteau	**57.1***	**62.5***	**65.7***	60.9	10.2	16.2	29.5
Conan	54.0	58.6	60.5	60.4	10.3	17.5	30.1
Corbin	**58.4***	60.4	62.1	60.1	10.2	17.2	32.2
Duclair	**59.1***	**65.5***		60.1	10.0	16.0	31.0
Fortuna	48.8	55.1	56.6	60.0	10.0	17.8	36.7
Hank	**56.7***	**65.5***	**69.5***	58.2	9.8	16.8	29.7
Jedd	52.8	60.4	64.5	60.1	10.1	16.4	27.0
Jerome	**62.3***	**65.6***	**70.0****	60.2	10.2	16.0	31.3
Kelby	54.0	58.7	59.1	61.3	10.0	17.9	27.9
Kuntz	**58.1***	**61.5***	64.3	61.1	10.1	15.8	29.1
McNeal	50.6	57.5	61.3	59.4	10.0	16.0	31.1
Mott	**56.1***	58.9		61.1	10.3	16.3	32.8
Oneal	**55.2***	**62.2***	**67.0***	59.7	10.3	16.2	31.4
Outlook	**57.6***	**61.3***	65.0	59.5	10.0	16.1	31.3
Reeder	**54.9***	58.8	61.9	61.3	10.2	16.1	31.1
Solano	51.1	60.5		58.7	9.8	18.6	35.3
Superb	48.3	56.6	60.0	59.8	10.2	17.5	37.2
SY Tyra	**54.5***			60.7	10.4	15.6	27.3
Traverse	**60.2***	**65.7****	**68.5***	59.6	10.0	16.2	31.6
Vida	**60.7***	**62.4***	65.4	60.2	10.5	15.8	31.9
Volt	**62.9****	**65.4***	**67.8***	62.3	10.4	16.2	30.0
WB Gunnison	**55.2***			60.7	10.4	16.9	28.0
Experimental							
IMICHT79	**58.3***			60.3	10.0	16.9	30.2
Average	56.0	61.0	63.8	60.3	10.2	16.6	31.1
PLSD (p=0.05)	6.5	5.1	4.5	1.1	0.3	0.9	1.8
CV%	17.6	18.1	18.8	2.8	4.0	8.4	9.0
Location Years	6	12	18	6	6	6	6

1/ Yields are based on 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).

Table 10. Performance of 25 spring wheat cultivars tested under irrigated conditions only in south central Montana during 2011. Cultivars listed alphabetically.

Cultivar	Grain Yield 1/ 2011	Grain Yield 1/ 2010-11	Grain Yield 1/ 2009-11	Test Weight	Grain Moisture	Grain Protein 2/	Plant Height	Lodging
	------- bushels/acre -------			lb/bu	%	%	inches	0-9
Commercial								
AC Lillian	78.3	74.5	78.6	59.5	10.5	16.0	34.9	0.0
AP604 CL	**85.8***	**87.4***	**93.1***	63.1	11.0	14.9	38.4	1.1
Choteau	84.5	**85.1***	**92.7***	62.1	10.8	15.4	35.3	0.7
Conan	79.8	80.7	85.8	61.1	11.0	16.9	35.3	0.0
Corbin	**89.6***	**82.9***	86.6	61.0	10.8	16.6	38.0	0.3
Duclair	**87.5***	**88.5***		61.0	10.5	15.4	37.3	0.3
Fortuna	72.6	74.2	78.6	60.5	10.4	17.1	43.9	6.7
Hank	**84.8***	**90.9***	**99.3****	58.3	10.3	16.4	35.4	0.4
Jedd	79.2	**85.1***	**92.6***	60.2	10.5	16.1	32.4	0.6
Jerome	**90.0***	**88.9***	**99.3****	61.7	10.8	15.3	36.8	0.0
Kelby	81.2	82.7	85.3	62.1	10.5	17.4	33.4	0.1
Kuntz	**88.5***	**86.0***	**92.6***	62.3	10.5	15.6	34.0	0.0
McNeal	77.0	80.9	88.0	60.7	10.3	15.0	37.2	0.0
Mott	83.5	81.2		61.7	11.0	15.2	39.8	0.0
Oneal	82.4	**84.4***	**94.0***	59.9	10.6	15.8	37.5	0.0
Outlook	**86.8***	**83.9***	**91.7***	60.7	10.7	15.5	37.9	0.3
Reeder	82.0	79.0	85.3	62.2	10.7	16.0	37.9	0.2
Solano	73.8	**82.9***		59.2	10.2	18.6	42.7	4.7
Superb	68.1	75.2	82.7	59.8	10.6	17.2	43.9	7.2
SY Tyra	82.2			61.6	11.0	15.1	32.2	0.0
Traverse	**89.9***	**91.3***	**98.3***	60.8	10.7	15.6	37.8	0.0
Vida	**85.5***	81.4	87.9	60.7	11.3	16.0	37.4	0.4
Volt	**96.0****	**92.1****	**98.4***	63.1	10.9	15.2	35.5	0.0
WB Gunnison	**85.7***			61.7	11.0	16.3	33.0	0.0
Experimental								
IMICHT79	**86.4***			61.1	10.6	16.0	37.4	0.0
Average	83.2	83.6	90.0	61.0	10.7	16.0	37.0	0.9
PLSD (p=0.05)	11.2	9.2	7.9	1.5	0.4	0.9	1.9	1.0
CV%	14.1	16.7	16.4	2.6	4.0	6.2	5.4	119.0
Location Years	3	6	9	3	3	3	3	3

1/ Yields are based on 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.
** 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 11. Performance of 25 spring wheat cultivars tested under dryland conditions only in south central Montana during 2011 Cultivars listed alphabetically.

Cultivar	Grain Yield 1/ 2011	Grain Yield 1/ 2010-11	Grain Yield 1/ 2009-11	Test Weight	Grain Moisture	Grain Protein 2/	Plant Height
	------- bushels/acre -------			lb/bu	%	%	inches
Commercial							
AC Lillian	**31.3***	37.1	35.8	58.7	9.6	16.7	24.7
AP604 CL	**33.3***	**39.6***	39.4	61.1	9.7	16.9	27.9
Choteau	29.7	**39.9***	38.7	59.8	9.6	17.0	23.6
Conan	28.2	36.5	35.1	59.7	9.7	18.0	25.0
Corbin	27.2	37.8	37.6	59.2	9.7	17.7	26.3
Duclair	**30.7***	**42.5***		59.2	9.6	16.5	24.7
Fortuna	24.9	35.9	34.6	59.6	9.6	18.5	29.4
Hank	28.6	**40.1***	**39.7***	58.2	9.4	17.3	23.9
Jedd	26.4	35.6	36.3	60.0	9.8	16.6	21.6
Jerome	**34.6***	**42.2***	**40.7***	58.7	9.7	16.7	25.8
Kelby	26.9	34.8	32.9	60.4	9.6	18.4	22.5
Kuntz	27.6	37.1	36.1	60.0	9.7	16.1	24.3
McNeal	24.2	34.0	34.5	58.1	9.6	17.0	25.0
Mott	28.6	36.7		60.6	9.7	17.3	25.8
Oneal	28.0	**40.1***	**40.1***	59.5	10.0	16.6	25.3
Outlook	28.3	38.7	38.2	58.2	9.4	16.7	24.8
Reeder	27.8	38.5	38.5	60.4	9.6	16.2	24.2
Solano	28.5	38.0		58.3	9.4	18.6	27.9
Superb	28.6	38.0	37.2	59.7	9.8	17.9	30.6
SY Tyra	26.7			59.8	9.8	16.2	22.3
Traverse	**30.6***	**40.0***	38.7	58.5	9.4	16.7	25.5
Vida	**35.9****	**43.4****	**42.9****	59.6	9.8	15.6	26.3
Volt	29.7	38.8	37.2	61.5	9.8	17.1	24.5
WB Gunnison	24.6			59.6	9.8	17.5	23.1
Experimental							
IMICHT79	30.2			59.5	9.5	17.8	23.0
Average	28.9	38.4	37.6	59.5	9.6	17.1	25.1
PLSD (p=0.05)	5.4	4.0	3.2	1.6	0.3	1.6	3.0
CV%	19.6	15.6	15.8	2.9	3.6	10.1	12.6
Location Years	3	6	9	3	3	3	3

1/ Yields are based on 60 pound standard bushel weight and adjusted to 13.0 percent moisture content.
2/ Grain protein values adjusted to 12 percent grain moisture content.
ns Indicates no significant difference between cultivars within a column based on Fisher's protected LSD (p=0.05).