RESULTS OF AGRONOMIC AND WEED SCIENCE RESEARCH CONDUCTED IN SOUTH CENTRAL MONTANA - 2000

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

http://www.sarc.montana.edu/annualreport/2000/

PROJECT TITLE:

Dryland and Irrigated Hard Red and Hard White Winter Wheat Variety Performance Trials near Broadview, Forsyth, Huntley, Indian Creek and Lodge Grass, Montana. (Exps. 003880, 003881, 003882, 003883 and 003884).

PROJECT LEADERS:

Kenneth D. Kephart, Agronomist, SARC, Huntley
Peggy F. Lamb, Research Associate, SARC, Huntley

PROJECT PERSONNEL:

Phil L. Bruckner, Winter Wheat Breeder, Bozeman
James E. Berg, Winter Wheat Research Associate, Bozeman
Tom A. Fischer, Research Specialist and Farm Foreman, SARC, Huntley
Paul Dixon, Yellowstone County Extension, Billings
Lee Schmelzer, Stillwater County Extension, Columbus
Todd Yeager, Rosebud/Treasure County Extension, Forsyth
Kirk Barnette, Big Horn County Extension, Hardin

COOPERATORS:

Tony Erickson, Farmer Cooperator, Broadview
Don Holland, Farmer Cooperator, Forsyth
Mike Hammond, Farmer Cooperator, Indian Creek
Carter Miklovich, Farmer Cooperator, Lodge Grass

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 wheat varieties. This information should help wheat producers in south central Montana select varieties best suited to their particular area and growing conditions.

METHODS:

Off-station winter wheat trials were established under dryland conditions near Broadview, Forsyth, Indian Creek and Lodge Grass, and under irrigation at Huntley (Fig. 1). Each 2000 off-station winter wheat trial had 24 entries and was planted using a randomized complete block design with three replications.

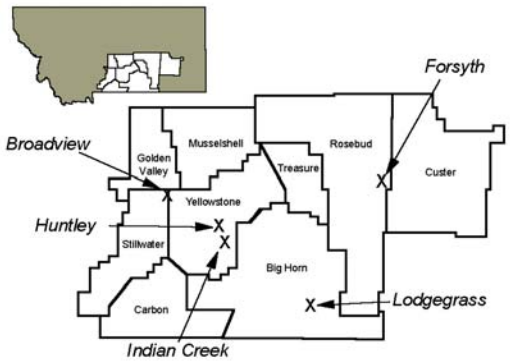

Figure 1. 2000 off-station winter wheat trial locations in south central Montana.

Dryland and irrigated test plots consisted of a 15-foot, 4-row plot with 12-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 60 pound standard bushel weight. Two year yield averages (1999-2000) are provided for cultivars tested the previous year. 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 for each entry bulked across replications. Grain protein values were 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. Reported values have been rounded to the nearest inch. Heading date was noted at the Huntley irrigated site when 50% of the heads in a plot had extended above the flag leaf collar. Heading dates were recorded in Julian days (number of days from January 1) for statistical purposes. Corresponding calendar dates are also presented.

RESULTS and SUMMARY:

Adequate soil moisture resulted in good germination and adequate winter wheat stands at all test sites except the Broadview and Huntley locations. The Huntley location experienced poor germination during the fall of 1999 due to dry surface soil moisture conditions that resulted from the lack of fall precipitation under recrop conditions. The Broadview site experienced poor germination during the fall of 1999, possibly resulting from herbicide residue related to a late season chemical fallow application. This site continued to suffer from thin, uneven stands until mid-May, when the Broadview trial was abandoned. Except for a short period of below-zero weather experienced during December, over-wintering temperatures were unusually mild, with little or no winter injury observed at the remaining four locations. Stands were fairly uniform at Huntley by the time of the first irrigation in May, but most entries had not tillered as well as observed during previous years. Spring weather was unusually warm and dry throughout the region, developing into drought conditions at the dryland sites by late spring or early summer. Russian wheat aphids (*Diuraphis noxia* Mord.) infested the Huntley and Indian Creek locations during mid-May, or at approximately the boot stage of crop development. Both of these sites also experienced brief exposure to hail on July 9th, partially shattering most entries. In spite of the hot, dry conditions that prevailed across this region during the grain fill period, winter wheat yields were average to above average. Test weights averaged higher than 60 pounds per bushel at each of the four harvested locations. Grain protein varied from 10.7 percent at Lodge Grass to 13.0 percent at Forsyth.

Forsyth winter wheat yields during 2000 averaged 43.4 bu/ac and ranged from 61.1 bu/ac for 'MT9513' to 19.9 bu/ac for 'Vanguard' (Table 1). 'Quantum 542' averaged 58.1 bu/ac in 2000 and was the only commercial variety to equal the top yielding entry, MT9513, at this location. The highest yielding entries the past two seasons have been Quantum 542, 'Halt' and 'Nuwest'. 2000 test weights averaged 61.6 lb/bu. 'Norstar' hard red winter wheat had the heaviest test weight at 62.9 lb/bu. Only 'Rampart', 'Vanguard' and 'MTS9882' wheats had test weights averaging less than 60 lb/bu. Grain protein averaged 13.0 percent and ranged from 16.0 percent for Vanguard to 10.0 percent for Norstar.

Agronomic performance of the winter wheat cultivars and experimental lines tested under irrigation near Huntley during 2000 is presented in Table 2. Huntley irrigated winter wheat yields averaged 77.6 bu/ac and ranged from 107.4 bu/ac for Halt to 59.3 bu/ac for MT9513. 'Judith', 'Bighorn' and Rampart yielded between 99.1 and 86.1 bu/ac, which was equal to the yield of Halt. Nineteen of the 24 entries had test weights heavier than 60 lb/bu. 'Nuplains' hard white winter wheat produced the heaviest test weight at 63.0 lb/bu, however 'Pronghorn', Halt, 'BigSky', 'Rocky', 'Tiber' and 'Erhardt' had test weights between 62.9 and 62.0 lb/bu, which were equal to that of Nuplains. Grain protein averaged 11.7 percent and ranged from 13.0 percent for Erhardt to 10.4 percent for Rocky.

Hail damage experienced at the Indian Creek location during early July partially shattered all plots, particularly those of early maturing entries. Largely because of the extensive variation in hail damage experienced from plot to plot, no differences

in yield were observed among the 24 winter wheats tested at Indian Creek during 2000 (Table 3). Plant heights at the Indian Creek location averaged 3 and 6 inches shorter than those observed at the Forsyth and Lodge Grass dryland trials, indicating a higher level of drought stress at Indian Creek during stem elongation which also may have limited the yield potential of this site. Sixteen of the 24 entries averaged test weights heavier than 60 lb/bu. Grain protein values varied from 13.2 percent for Erhardt to 10.1 percent for 'MTS9882'.

Agronomic performance of the winter wheat cultivars and experimental lines tested under dryland conditions near Lodge Grass during 2000 is presented in Table 4. Lodge Grass winter wheat yields averaged 67.6 bu/ac in 2000 and ranged from 82.8 bu/ac for Quantum 542 to 55.2 bu/ac for NuWest. 'Neeley', MTS9882, 'MT9426', Pronghorn, BigSky and 'Promontory' yielded between 77.6 and 73.1 bu/ac, which was equal to the yield of Quantum 542. Nuplains had the highest test weight at 64.5 lb/bu. All entries at Lodge Grass had test weights greater than 60 lb/bu during 2000. In spite of additional nitrogen applied during heading, grain protein levels at Lodge Grass averaged only 10.7 percent. Grain protein levels among the entries tested ranged from 13.6 percent for 'McGuire' to 9.3 percent for Norstar.

Multi-location average agronomic performance is presented in Table 5. Multi-location yield comparisons are presented in Table 6. Across the four harvested locations, winter wheat yields averaged 55.6 bu/ac or more than 15 bu/ac less than yields experienced on these sites in 1999. Halt, Judith, Quantum 542, Promontory and Pronghorn were the highest yielding cultivars overall among the 24 entries tested during 2000 (Table 6). These same five cultivars also represent the highest yielding group among entries tested the past two years at these locations (Table 5). Average test weight in 2000 was 61.5 lb/bu with no entry averaging less than 60 lb/bu. Average grain protein across locations was below normal at 11.8 percent, mostly due to low protein values produced at the Lodge Grass and Huntley locations.

FUTURE PLANS:

Five off-station winter wheat cultivar evaluations were planted during the fall of 2000 for continuation of the program through 2001. The Broadview location has been discontinued. Test locations for 2001 are Forsyth, Huntley, Indian Creek, Lodge Grass, and a new test site north of Rapelje on the Gary Broyles farm.

Table 1. Performance of 24 hard red and hard white winter wheat cultivars and experimental lines tested under dryland conditions near Forsyth, Montana during 2000. Cultivars listed alphabetically. (Exp. 003882).

Cultivar	Grain Yield 1/ 2000	Grain Yield 1/ 1999-2000	Test Weight	Grain Moisture	Plant Height	Grain Protein 2/
	bushels/acre		lb/bu	%	inches	%
Bighorn	48.8	52.0	62.2	12.3	26	11.1
BigSky (MT9432)	38.5	47.8	62.2	12.0	30	14.1
Elkhorn	48.3	48.1	61.3	12.0	32	11.9
Erhardt	31.1	43.8	61.3	12.3	29	14.8
Halt	46.0	**56.4***	61.0	11.7	26	12.6
Judith	47.5	54.9	60.2	12.2	31	13.2
MT9426	47.8		62.4	12.3	27	13.9
MT9513	**61.1****		62.3	12.4	31	11.0
MTS9720	48.9	54.6	62.5	12.4	31	10.8
MTS9882	25.5		59.1	12.3	27	14.7
MTW9441 (hard white)	50.3	53.4	62.6	12.3	30	12.5
McGuire	43.3	48.1	61.8	12.1	29	14.7
Morgan	48.5	52.1	62.6	12.1	31	12.0
Neeley	40.8	49.1	61.9	12.1	28	12.7
Norstar	45.4	47.6	62.9	12.3	38	10.0
Nuplains (hard white)	37.4		62.3	12.4	26	13.9
NuWest (hard white)	51.4	**55.6***	62.5	12.5	31	11.8
Promontory	45.8	53.8	62.4	12.2	31	12.2
Pronghorn	43.5	51.7	61.2	12.4	31	12.8
Quantum 542	**58.1***	**60.9****	62.3	12.4	31	13.1
Rampart	25.2	38.6	59.4	11.6	28	14.9
Rocky	40.7	49.1	62.3	12.3	31	13.1
Tiber	48.2	54.2	62.0	12.0	29	13.0
Vanguard	19.9	35.5	56.8	11.5	29	16.0
Average	43.4	50.4	61.6	12.2	30	13.0
LSD (p=0.05)	8.2	5.4	1.4	0.2	2.7	-
CV%	11.6	9.4	1.4	1.2	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).

Forsyth Dryland Winter Wheat (Exp. 003882)

Planted:	September 22, 1999
Harvested:	July 20, 2000
Fertility:	11-52-0, 120 lb/ac in-furrow, September 22, 2000 40-20-0, 75 lb/ac broadcast, May 18, 2000
Herbicide:	Harmony Extra, 0.3 oz/ac; Buctril, 1 pt/a; R-11, 1 pt/ac, May 18, 2000
Insecticide:	none
Previous Crop:	summer fallow
Precipitation:	not available

Table 2. Performance of 24 hard red and hard white winter wheat cultivars and experimental lines tested under irrigated conditions near Huntley, Montana during 2000. Cultivars listed alphabetically. (Exp. 003880).

Cultivar	Grain Yield 1/		Test Weight	Grain Moisture	Plant Height	Heading Date		Grain Protein 2/
	2000	1999-2000				Julian	Calendar	
	bushels/acre		lb/bu	%	inches			%
Bighorn	**96.2***	98.6	61.1	10.2	34	162	Jun 11	10.7
BigSky (MT9432)	75.2	**101.0***	62.2	10.2	43	163	Jun 12	11.9
Elkhorn	64.5	79.0	60.1	10.0	47	165	Jun 14	12.0
Erhardt	71.2	87.8	62.0	10.0	35	161	Jun 10	13.0
Halt	**107.4****	**113.3****	62.3	10.0	32	154	Jun 3	10.7
Judith	**99.1***	**108.8***	59.4	10.1	38	161	Jun 10	11.4
McGuire	67.6	86.4	61.1	10.2	32	157	Jun 6	12.6
Morgan	70.5	89.4	60.4	9.9	39	163	Jun 12	11.9
MT9426	79.3		59.4	10.0	36	163	Jun 12	11.4
MT9513	59.3		57.9	9.7	41	164	Jun 13	11.9
MTS9720	77.1	84.5	58.4	9.9	39	164	Jun 13	12.7
MTS9882	70.0		59.6	10.1	35	166	Jun 15	12.0
MTW9441 (hard white)	75.3	**101.4***	60.6	9.8	41	162	Jun 11	11.8
Neeley	71.0	90.2	60.4	10.1	40	165	Jun 14	11.9
Norstar	66.0	68.5	61.6	10.2	53	167	Jun 16	12.3
Nuplains (hard white)	83.7		63.0	10.6	33	160	Jun 9	12.0
NuWest (hard white)	76.4	**102.6***	60.5	9.9	41	162	Jun 11	11.3
Promontory	82.2	**110.7***	61.9	10.1	35	158	Jun 7	10.5
Pronghorn	82.9	**107.4***	62.9	10.4	37	157	Jun 6	11.9
Quantum 542	71.4	**100.7***	61.3	10.2	39	160	Jun 9	11.2
Rampart	**86.1***	96.5	61.4	10.1	40	161	Jun 10	11.8
Rocky	81.0	**101.9***	62.1	10.3	40	158	Jun 7	10.4
Tiber	73.1	91.4	62.0	10.3	41	164	Jun 13	11.9
Vanguard	76.0	90.6	60.8	10.4	41	162	Jun 11	11.8
Average	77.6	95.3	60.9	10.1	39.0	161.7	Jun 10	11.7
LSD (p=0.05)	23.5	14.1	1.0	0.2	3.6	2.9		-
CV%	18.4	12.8	1.0	1.3	5.6	1.1		-

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.
** 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. 003880)

Planted:	October 4, 1999	Herbicide:	Harmony Extra, 0.33 oz/ac; Buctril, 1 pt/ac; R-11, 1 pt/ac, May 1, 2000
Harvested:	August 4, 2000	Insecticide:	Di-Syston 8E, 12 oz/ac; R-11, 1 pt/ac, May 19, 2000
Fertility:	32-13-0-6, 316 lb/ac, preplant incorporated, September 30, 1999	Previous Crop:	barley
	34-0-0, 88 lb/ac broadcast, May 18, 2000	Irrigation:	profile flooded, May 24, 2000 and June 8, 2000
Precipitation:	8.41 inches		

Table 3. Performance of 24 hard red and hard white winter wheat cultivars and experimental lines tested under dryland conditions at the Indian Creek location near Huntley, Montana during 2000. Cultivars listed alphabetically. (Exp. 003884).

Cultivar	Grain Yield 1/	Test Weight	Grain Moisture	Plant Height	Grain Protein 2/
	bushels/acre	lb/bu	%	inches	%
Bighorn	24.8	60.3	13.1	23	12.1
BigSky (MT9432)	39.4	61.1	13.4	30	10.9
Elkhorn	28.9	59.5	12.7	29	12.9
Erhardt	31.2	60.5	13.4	27	13.2
Halt	41.7	62.3	11.6	27	10.3
Judith	35.8	59.4	13.8	30	11.4
MT9426	27.8	59.4	13.0	22	12.0
MT9513	29.5	58.5	14.5	26	13.0
MTS9720	29.7	58.7	12.0	25	13.3
MTS9882	44.8	61.3	12.3	24	10.1
MTW9441 (hard white)	38.3	59.8	14.7	26	11.3
McGuire	29.6	60.9	12.1	27	13.3
Morgan	36.8	60.5	12.7	29	11.8
Neeley	31.8	60.4	13.1	27	10.9
Norstar	35.7	60.3	13.7	33	11.3
Nuplains (hard white)	27.8	62.7	13.4	23	12.4
NuWest (hard white)	30.9	59.8	13.2	27	12.2
Promontory	38.9	62.6	12.3	29	11.1
Pronghorn	36.1	60.5	12.2	30	11.5
Quantum 542	35.5	61.1	12.6	30	11.1
Rampart	37.4	60.5	11.9	26	14.2
Rocky	32.0	61.5	12.6	27	12.7
Tiber	30.3	58.5	14.3	28	11.9
Vanguard	33.3	60.1	12.3	22	12.1
Average	33.7	60.4	13.0	27	12.0
LSD (p=0.05)	ns	2.1	1.5	4.7	-
CV%	21.3	2.2	7.0	10.6	-

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

Indian Creek Dryland Winter Wheat (Exp. 003884)

Planted:	September 22, 1999
Harvested:	July 21, 2000
Fertility:	42-0-0, 143 lb/ac preplant incorporated, applied by cooperator, date unknown 11-52-00, 120 lb/ac in-furrow, September 23, 2000 40-20-00, 75 lb/ac broadcast, May 18, 2000
Herbicide:	Ally, 0.1 oz/ac; 2,4-D, 8 oz/ac; applied by cooperator, date unknown
Insecticide:	none
Previous Crop:	summer fallow
Precipitation:	not available

Table 4. Performance of 24 hard red and hard white winter wheat cultivars and experimental lines tested under dryland conditions near Lodge Grass, Montana during 2000. Cultivars listed alphabetically. (Exp. 003883).

Cultivar	Grain Yield 1/ 2000	Grain Yield 1/ 1999-2000	Test Weight	Grain Moisture	Plant Height	Grain Protein 2/
	bushels/acre		lb/bu	%	inches	%
Bighorn	65.5	75.2	63.1	9.0	30	10.6
BigSky (MT9432)	**73.8***	82.2	64.5	10.1	35	10.2
Elkhorn	57.2	67.6	61.4	11.2	38	10.4
Erhardt	63.1	71.0	64.1	9.2	31	10.9
Halt	69.7	72.7	63.6	8.6	29	10.9
Judith	72.0	78.0	62.3	9.6	32	11.0
McGuire	58.1	62.5	62.6	9.8	34	13.6
Morgan	56.1	71.2	62.7	10.6	34	10.5
MT9426	**76.2***		63.0	10.6	28	10.1
MT9513	71.4		62.6	10.4	32	10.3
MTS9720	69.0	79.6	62.2	10.3	34	10.4
MTS9882	**77.1***		63.2	9.0	30	10.3
MTW9441 (hard white)	63.9	80.9	61.7	12.0	33	10.2
Neeley	**77.6***	**88.7***	63.2	10.4	33	10.1
Norstar	67.1	72.8	62.9	9.7	44	9.3
Nuplains (hard white)	56.4		64.5	9.6	30	11.3
NuWest (hard white)	55.2	72.3	61.0	12.2	31	10.3
Promontory	**73.1***	82.6	64.2	9.8	33	10.2
Pronghorn	**74.4***	79.4	63.3	8.9	37	10.3
Quantum 542	**82.8****	**90.8****	64.3	9.4	35	11.1
Rampart	64.0	73.6	63.5	8.7	32	10.9
Rocky	63.5	75.9	63.3	10.2	35	10.9
Tiber	65.9	74.5	63.0	9.9	35	10.4
Vanguard	70.0	76.2	63.6	9.0	33	11.4
Average	67.6	76.4	63.1	9.9	33.3	10.7
LSD (p=0.05)	10.6	7.5	1.4	1.7	2.8	-
CV%	9.6	8.5	1.3	10.3	5	-

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).

Lodge Grass Dryland Winter Wheat (Exp. 003883)

Planted:	September 29, 1999
Harvested:	July 25, 2000
Fertility:	11-52-00, 120 lb/ac in-furrow, September 29, 2000
	40-20-00, 75 lb/ac broadcast, May 19, 2000
Herbicide:	applied by cooperator, date unknown
Insecticide:	none
Previous Crop:	summer fallow
Precipitation:	not available

Table 5. Performance of 24 hard red and hard white winter wheat cultivars and experimental lines tested under dryland and irrigated conditions at 4 locations in south central Montana during 2000. Cultivars listed alphabetically.

Cultivar	Grain Yield 1/ 2000	Grain Yield 1/ 1999-2000	Test Weight	Grain Moisture	Plant Height	Grain Protein 2/
	bushels/acre		lb/bu	%	inches	%
Bighorn	58.8	75.3	61.7	11.1	28	11.1
BigSky (MT9432)	56.7	77.0	62.5	11.4	35	11.8
Elkhorn	49.7	64.9	60.6	11.5	37	11.8
Erhardt	49.1	67.5	62.0	11.2	31	13.0
Halt	**66.2****	**80.8***	62.3	10.5	28	11.1
Judith	**63.6***	**80.6***	60.3	11.4	33	11.8
McGuire	49.7	65.7	61.6	11.1	30	13.6
Morgan	53.0	70.9	61.6	11.3	33	11.6
MT9426	57.8		61.0	11.5	29	11.9
MT9513	55.3		60.3	11.8	32	11.6
MTS9720	56.2	72.9	60.5	11.2	32	11.8
MTS9882	54.3		60.8	10.9	29	11.8
MTW9441 (hard white)	56.9	78.6	61.2	12.2	33	11.5
Neeley	55.3	76.0	61.5	11.4	32	11.4
Norstar	53.5	63.0	61.9	11.5	42	10.7
Nuplains (hard white)	51.3		63.1	11.5	28	12.2
NuWest (hard white)	53.5	76.8	60.9	11.9	33	11.6
Promontory	**60.0***	**82.4***	62.8	11.1	32	11.0
Pronghorn	**59.2***	**79.5***	62.0	11.0	34	11.6
Quantum 542	**62.0***	**84.1****	62.3	11.2	34	11.6
Rampart	53.2	69.6	61.2	10.6	32	13.0
Rocky	54.3	75.6	62.3	11.4	33	11.8
Tiber	54.4	73.4	61.4	11.7	33	11.8
Vanguard	49.8	67.4	60.3	10.8	32	12.8
Average	55.6	74.1	61.5	11.3	32.2	11.8
LSD (p=0.05)	7.2	5.5	0.8	0.6	1.7	0.7
CV%	16.1	11.4	1.5	6.1	6.6	6.9

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 6. Grain yield[1/] of 24 hard red and hard white winter wheats tested at four locations in south central Montana during 2000. Varieties listed by declining average yield.

	Location				
	Forsyth Dryland	Huntley Irrigated	Indian Creek Dryland	Lodge Grass Dryland	Four Location Average
	bushels/acre				
Halt	46.0	**107.4****	41.7	69.7	**66.2****
Judith	47.5	**99.1***	35.8	72.0	**63.6***
Quantum 542	**58.1***	71.4	35.5	**82.8****	**62.0***
Promontory	45.8	82.2	38.9	**73.1***	**60.0***
Pronghorn	43.5	82.9	36.1	**74.4***	**59.2***
Bighorn	48.8	**96.2***	24.8	65.5	58.8
MT9426	47.8	79.3	27.8	**76.2***	57.8
MTW9441 (hard white)	50.3	75.3	38.3	63.9	56.9
BigSky (MT9432)	38.5	75.2	39.4	**73.8***	56.7
MTS9720	48.9	77.1	29.7	69.0	56.2
MT9513	**61.1****	59.3	29.5	71.4	55.3
Neeley	40.8	71.0	31.8	**77.6***	55.3
Tiber	48.2	73.1	30.3	65.9	54.4
MTS9882	25.5	70.0	44.8	**77.1***	54.3
Rocky	40.7	81.0	32.0	63.5	54.3
Norstar	45.4	66.0	35.7	67.1	53.5
NuWest (hard white)	51.4	76.4	30.9	55.2	53.5
Rampart	25.2	**86.1***	37.4	64.0	53.2
Morgan	48.5	70.5	36.8	56.1	53.0
Nuplains (hard white)	37.4	83.7	27.8	56.4	51.3
Vanguard	19.9	76.0	33.3	70.0	49.8
Elkhorn	48.3	64.5	28.9	57.2	49.7
McGuire	43.3	67.6	29.6	58.1	49.7
Erhardt	31.1	71.2	31.2	63.1	49.1
Average	43.4	77.6	33.7	67.6	55.6
LSD (p=0.05)	8.2	23.5	ns	10.6	7.2
CV%	11.6	18.4	21.3	9.6	16.1

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).