

# RESULTS OF AGRONOMIC AND WEED SCIENCE RESEARCH CONDUCTED IN SOUTH CENTRAL MONTANA - 2020

ANNUAL REPORT OF THE INVESTIGATIONS AT AND ADMINISTRATION OF THE  
SOUTHERN AGRICULTURAL RESEARCH CENTER, HUNTLEY, MONTANA

[SARC Website](#)

**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.*

**PROJECT LEADERS:** Kent A. McVay, Cropping System Specialist, SARC, Huntley  
Qasim A. Khan, Research Scientist, SARC, Huntley  
Hwa Young Heo, Spring Wheat Research Associate, PSPP, Bozeman

**PROJECT PERSONNEL:** Shane Leland, General Farm Operations Manager, SARC, Huntley  
Ken Kephart, Agronomist and Superintendent, SARC Huntley  
Janna Rozett, Research Assistant III, SARC, Huntley  
Callie Cooley, Yellowstone County Extension, Billings  
Melissa Ashley, Rosebud/Treasure County Extension, Forsyth  
Lee Schmelzer, Stillwater County Extension, Columbus

**COOPERATORS:** Brent Icopini, Hysham  
Ervin Schlemmer, Fromberg  
Keith & Karen Schott, Broadview  
Stephen Becker, Billings

**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 2020 off-station spring wheat trials in south central Montana were established under dryland conditions near Billings, Broadview and Huntley, and under irrigated conditions near Huntley, Fromberg and Hysham, Montana (Figure 1). The spring wheat trials for this region of Montana each possessed 25 entries made up of 17 commercial cultivars and 8 experimental lines.

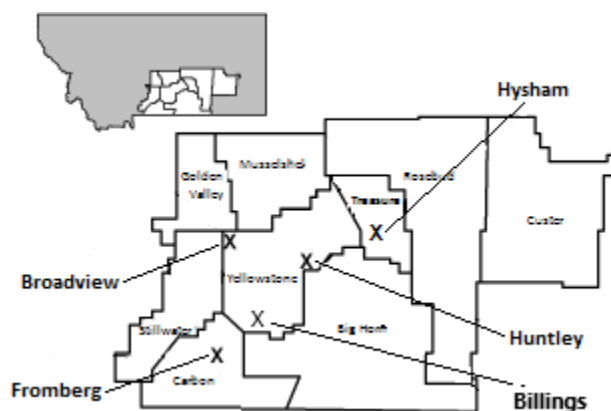


Figure 1. 2020 off-station spring wheat trial locations in south central Montana.

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 per acre) and 1.5 million seeds per acre under irrigation (~90 lb per acre). Seeding rates were not adjusted for germination. Dryland test plots consisted of a 16-foot, 4-row plot with 12-inch row spacing, while irrigated plots were 16-foot, 7-row with 7-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. Test weight and grain moisture content were obtained for each plot using a Dickey-John™ GAC 2100 grain analyzer. Grain protein 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 at Huntley, Fromberg, and Hysham on a scale ranging from (0 representing no lodging), to 9 (all stems lying flat on the ground).

## **RESULTS:**

The 2020 spring wheat test sites had below average rain or snow accumulation during winter months except in November. Below average precipitation was observed throughout the 2020 wheat growing season except in June. However, precipitation during the months of March and April provided enough moisture for spring wheat emergence and early stand establishment. Unusually high rainfall in June (4.75 inches) provided much of the needed moisture during grain filling period. This however delayed the spring wheat maturity at some dryland sites.

Spring wheat yield at Huntley under dryland condition averaged 77 bushel per acre in 2020 (Table 1). High yield at this location this year was mainly attributed to high moisture availability during grain filling period. The experimental line 'MT1716' was the highest yielding entry with 90 bushel per acre. Seven other entries have the yield statistically equal to that of highest yielding entry. 'Dagmar' was the highest yielding commercial cultivar with 89 bushel per acre. Spring wheat test weight averaged 62.2 lb per bushel and all entries had test weight above 60 lb per bushel. Grain protein content was high averaging 15.3% and all entries have protein content over 14%. Averaged yield over the past two- (2018 and 2020) and three-years (2017-18, and 2020) was 73 and 66 bushel per acre respectively.

Dryland spring wheat yield at Broadview averaged 46 bushel per acre in 2020 (Table 2), about 17 bushel per acre lower compared to last year's average yield of 63 bushel per acre. This location suffered this year with drought stress that caused spring wheat yield reduction. 'CP3099' was the highest yielding entry with 53 bushel per acre. 'Alum' was the highest yielding commercial cultivar and has yield statistically equal to 'CP3099'. Test weight was excellent and averaged 63.7 lb per bushel. All entries at Broadview had test weight above 60 lb per bushel. Grain protein content averaged 10.8% and ranged from 9.7 to 12%. Averaged yield over the past two- and three-years was 55 and 47 bushel per acre respectively.

South Billings was a new dryland site for statewide spring wheat variety trials this year. Spring wheat yield at this site averaged 59 bushel per acre in 2020 (Table 3). 'Duclair' and 'MT1716' were the highest yielding entries with 63 bushel per acre. Fourteen other entries have the yield statistically equal to that of highest yielding entries. Test weight averaged 61.9 lb per bushel and all entries except 'CP3099' had test weight above 60 lb per bushel. Grain protein content averaged 14.6% and all entries had protein content over 13%.

Excellent grain yield was observed for the irrigated spring wheat trial at Huntley which averaged 112 bushel per acre in 2020 (Table 4). Grain yield ranged from 88 bushel per acre for 'Fortuna' to 129 bushel per acre for 'Lanning'. Three other entries produced yield statistically equal to that of highest yielding cultivar. Test weight averaged 61.8 lb per bushel. All entries had test weight of 60 lb per bushel or more. Grain protein levels were high and averaged 15.2%. All entries had grain protein content above 14%. Grain yield over the past two- (2018 and 2020) and three-years (2017-18 and 2020) was 91 and 62 bushel per acre respectively under irrigation at Huntley.

Limited or low lodging was observed for most entries under irrigation at Hysham in 2020 and averaged 1.0 on a scale of 1-9 (Table 5). Grain yield at Hysham averaged 102 bushel per acre. Yield ranged from 82 bushel per acre for 'Fortuna' to 117 bushel per acre for 'CP3099'. Six other entries produced yield statistically equal to the yield of highest yielding cultivar. Test weight averaged 61.9 lb per bushel, and ranged from 57.5 to 64.0 lb per bushel. Grain protein was high averaging 14.6% and all entries

except 'CP3099' had protein content above 13%. In 2020 the spring wheat trial was embedded in a spring wheat field for the first time in several years. Typically the spring grain crop trials are located in an irrigated malt barley field. The higher nitrogen fertility needed for spring wheat production may have improved overall yield performance in 2020 as compared to previous years. Average yield, over the past two and three years was 80 and 82 bushel per acre respectively. 'Dagmar' was the highest yielding cultivar over the past two- and three-years averaging 92 and 93 bushel per acre respectively.

Moderate lodging was observed under irrigation at Fromberg in 2020 (Table 6). 'Fortuna' and 'MT1716' exhibited highest lodging score of 7.0 and 6.1. The yield at Fromberg averaged 116 bushel per acre about 20 bushel per acre higher than last year. Grain yield ranged from 106 bushel per acre for 'Fortuna' to 136 bushel per acre for 'CP3520'. Four other entries yielded statistically equal to the highest yielding cultivar. Test weight averaged 63.8 lb per bushel and all entries produced test weight over 60lb per bushel at Fromberg. Grain protein content averaged 13.5% and ranged from 12.0% to 15.5%. Two and three year average yield for spring wheat varieties tested at Fromberg were 105 and 98 bushel per acre respectively. 'WB9879CLP' was the highest yielding cultivar over the last three years producing 108bushel per acre at Fromberg.

### **SUMMARY:**

Below average precipitation was observed throughout the 2020 wheat growing season except in June. High rainfall in June (4.75 inches) provided much of the needed moisture during grain filling period and boosted spring wheat yield at most of the dryland test locations. Dryland grain yield averaged 61 bushel per acre (Tables 7 and 10), while it averaged 110 bushel per acre under irrigated conditions in 2020 (Tables 7 and 9). 'Vida' was the top yielding cultivar with 69 bushel per acre under dryland condition (Table 10). 'WB9879CLP' was the highest yielding cultivar, averaging 92bushel per acre, across all locations tested in south central Montana closely followed by the cultivars 'Duclair' and 'Dagmar' (Tables 7 and 8). 'Across all locations for the past three years, 'Dagmar' and 'WB9879CLP' were the top yielding cultivars (Table 7). Averaged across locations grain protein content was 14.0%. Test weight averaged 62.6 lb per bushel over all locations (Table 8), and averaged 62.5 lb per bushel across irrigated locations (Table 9).

Table 1. Performance of 25 spring wheat cultivars tested under no-till, dryland conditions near Huntley, MT. (Experiment 209908).

Cultivar	Yield 2020 bu/a	Yield 2018-20 bu/a	Yield 2017-20 bu/a	Test Weight lb/bu	Grain Moisture %	Grain Protein %	Plant Height inches	Heading Date
<u>Commercial</u>								
Alum	73.1	68.5	70.6	62.4	10.5	14.1	34.5	Jun 16
Brennan	66.9	65.7	68.1	63.3	10.6	15.6	31.9	Jun 15
Choteau	<b>84.1</b>	81	77.9	61.7	10.5	14.8	34.9	Jun 16
Corbin	71.8	70.5	73.2	63.0	10.7	14.8	34.2	Jun 13
Dagmar	<b>88.6</b>	82.9	-	61.7	10.6	15.8	35.6	Jun 14
Duclair	78.4	77.9	76.4	61.8	10.6	14.3	34.8	Jun 14
Egan	80.7	77.7	76.1	61.3	10.0	16.6	35.1	Jun 18
Fortuna	68.1	66.1	68.1	61.8	10.6	15.2	43.5	Jun 17
Lanning	70.7	72.3	76.7	62.0	10.0	16.6	32.3	Jun 11
LCS Pro	<b>83.9</b>	77	77.9	62.5	10.4	15.3	38.4	Jun 14
NS Presser CLP	77.4	77.3	75.4	61.1	10.0	16.7	33.8	Jun 18
Reeder	74.2	71.4	73.1	62.4	10.3	15.4	36.2	Jun 15
SY Ingmar	76.9	71.2	73.4	63.2	10.6	14.9	33.2	Jun 17
SY Soren	79.0	75.5	75.2	63.0	10.5	15.6	32.1	Jun 15
Vida	<b>87.1</b>	81.9	80.5	61.8	10.6	14.5	34.6	Jun 16
WB 9879CLP	<b>83.8</b>	78.9	75.4	61.8	10.4	15.3	33.7	Jun 15
WB Gunnison	74.5	72.6	70.6	62.8	10.6	13.6	32.1	Jun 16
<u>Experimental</u>								
CP3099	74.0	-	-	62.1	10.4	15.5	38.0	Jun 16
CP3530	67.6	-	-	63.1	10.5	15.7	31.6	Jun 17
CP3903	72.9	-	-	62.3	10.2	15.6	39.6	Jun 18
CP3910	56.3	-	-	62.3	10.2	15.9	25.8	Jun 19
CP3915	70.4	-	-	62.3	10.4	16.8	28.8	Jun 20
MT1716	<b>89.9</b>	-	-	61.9	10.9	14.8	34.9	Jun 13
MT1855	<b>85.6</b>	-	-	61.2	10.5	14.8	38.3	Jun 19
MT1866	<b>83.2</b>	-	-	62.7	10.7	14.6	35.9	Jun 15
Average	76.7	72.9	66.0	62.2	10.5	15.3	34.6	167.4
LSD	7.9	ns	ns	0.7	0.2	0.4	1.6	1.6
CV%	6.0	5.8	6.4	0.6	1.0	1.4	2.6	0.5
Lattice RE%	104			102	100	104	120	123

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

Grain protein values adjusted to 12 percent grain moisture content.

Average heading date is number of calendar days in the year.

**Bold** Indicates highest yielding cultivar within a column.

**Bold** 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 (Experiment 209908)

Planted:	March 11, 2020
Harvested:	Aug. 5, 2020
Fertility:	soil had 86 lb/a residual NO <sub>3</sub> -N, applies 165 lb/a N in spring 2020
Herbicide:	Wildcard Xtra 12 oz/ac+ Affinity BS 0.6 oz/ac + AxialStar 16 oz/ac at jointing stage
Previous Crop:	chemical fallow
Precipitation:	9.1 inches

Table 2. Performance of 25 spring wheat cultivars tested under no-till, dryland conditions near Broadview, MT. (Experiment 209995).

Cultivar	Yield 2020 bu/a	Yield 2019-20 bu/a	Yield 2018-20 bu/a	Test Weight lb/bu	Grain Moisture %	Grain Protein %	Plant Height inches
<u>Commercial</u>							
Alum	<b>50.6</b>	54.8	46.9	64.3	10.0	10.1	29.9
Brennan	37.5	52.0	43.3	64.6	9.4	12.3	25.5
Choteau	45.3	55.1	46.1	63.9	9.7	11.0	31.0
Corbin	<b>48.9</b>	55.3	48.1	64.0	9.9	10.6	31.0
Dagmar	46.5	62.2	50.9	64.4	9.9	11.1	30.3
Duclair	47.7	57.9	48.5	63.5	9.7	10.6	31.6
Egan	45.4	52.4	43.6	62.3	9.3	11.9	31.1
Fortuna	46.5	48.2	42.9	63.1	9.7	10.9	36.4
Lanning	47.0	58.1	49.3	64.1	9.5	10.9	28.7
LCS Pro	44.5	52.7	44.8	63.7	10.0	10.5	31.2
NS Presser	43.8	56.2	48.9	62.4	9.5	12.4	30.2
Reeder	44.4	55.1	46.8	64.0	9.8	10.4	31.9
SY Ingmar	42.1	51.8	45.7	63.9	9.8	11.3	28.3
SY Soren	45.3	54.0	44.8	64.3	9.6	11.1	26.9
Vida	<b>50.3</b>	61.1	51.6	63.6	9.8	10.1	30.6
WB Gunnison	46.9	54.3	45.7	63.8	9.8	10.6	29.7
WB9879CLP	45.6	54.7	47.2	64.6	9.7	10.9	30.1
<u>Experimental</u>							
CP3099	<b>52.5</b>	-	-	60.0	9.7	9.7	34.6
CP3530	<b>51.2</b>	-	-	63.9	9.8	10.4	32.3
CP3903	37.3	-	-	64.1	9.7	11.1	28.2
CP3910	45.8	-	-	64.8	10.0	10.0	28.3
CP3915	47.9	-	-	64.5	10.1	10.6	28.6
MT1716	47.2	56.6	-	65.1	10.1	10.4	29.1
MT1855	46.5	-	-	62.8	9.8	10.2	32.7
MT1866	<b>50.4</b>	-	-	63.6	9.9	10.2	32.4
Average	46.3	55.1	46.8	63.7	9.8	10.8	30.4
PLSD (p=0.05)	3.8	ns	ns	0.4	0.2	0.5	2.1
CV%	4.5	7.4	8.5	0.4	1.4	2.3	4.4
Lattice RE%	220	100	100	100	100	174	100

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

Grain protein values adjusted to 12 percent grain moisture content.

**Bold** Indicates highest yielding cultivar within a column.

**Bold** 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).

Broadview Dryland Spring Wheat (Experiment 209995)

Planted:	April 10, 2020
Harvested:	August 13, 2020
Fertility:	30-0-0-5 NPKS 5/12/2020 as 28% UAN + S
Herbicide:	n/a
Insecticide:	none applied
Previous Crop:	Chickpea
Precipitation:	not measured

Table 3. Performance of 25 spring wheat cultivars tested under no-till, dryland conditions near Billings, Montana during 2020. Cultivars listed alphabetically. (Experiment 209994).

<b>Cultivar</b>	<b>Yield 2020 bu/a</b>	<b>Test Weight lb/bu</b>	<b>Grain Moisture %</b>	<b>Grain Protein %</b>	<b>Plant Height inches</b>
<u>Commercial</u>					
Alum	<b>61.7</b>	60.7	8.4	14.4	31.9
Brennan	57.0	63.6	8.3	16.0	30.0
Choteau	<b>58.8</b>	62.0	8.3	14.7	30.2
Corbin	53.0	62.5	8.5	15.4	31.9
Dagmar	<b>62.0</b>	62.7	8.6	15.2	34.0
Duclair	<b>62.7</b>	62.0	8.4	14.5	31.6
Egan	<b>60.9</b>	60.0	8.1	16.1	31.2
Fortuna	53.1	61.6	8.4	14.4	40.5
Lanning	<b>58.9</b>	62.8	8.6	14.2	32.7
LCS Pro	<b>59.2</b>	62.6	8.6	15.0	34.8
NS Presser	<b>60.3</b>	60.2	8.1	15.9	31.0
Reeder	56.2	62.7	8.5	14.4	33.6
SY Ingmar	56.3	62.6	8.6	15.1	31.3
SY Soren	57.0	62.6	8.4	14.7	30.4
Vida	<b>62.0</b>	62.3	8.6	13.4	31.7
WB Gunnison	53.8	62.0	8.7	14.2	30.7
WB9879CLP	<b>59.2</b>	62.3	8.3	15.1	30.6
<u>Experimental</u>					
CP3099	53.5	55.3	8.2	13.1	36.6
CP3530	<b>59.0</b>	60.8	8.4	14.6	32.3
CP3903	52.7	63.0	8.5	14.5	31.6
CP3910	<b>61.5</b>	63.2	8.7	14.0	28.5
CP3915	<b>59.8</b>	62.9	8.8	14.5	29.9
MT1716	<b>63.1</b>	62.9	8.7	14.1	33.3
MT1855	<b>59.9</b>	61.9	8.7	13.4	34.5
MT1866	<b>60.6</b>	62.1	8.5	14.0	33.4
Average	58.5	61.9	8.5	14.6	32.3
PLSD (p=0.05)	4.6	0.5	0.2	0.8	2.0
CV%	4.8	0.5	1.2	2.9	3.5
Lattice RE%	100	123	100	122	118

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

Grain protein values adjusted to 12 percent grain moisture content.

**Bold** Indicates highest yielding cultivar within a column.

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

Billings Dryland Spring Wheat (Experiment 209994)

---

Planted:	April 09, 2020
Harvested:	August 11, 2020
Fertility:	14-0-0-6 lb/a NPKS preplant; top-dressed with 50 N lb/a as urea at jointing stage
Herbicide:	8 oz LV6 + 5 oz Pixxaro
Insecticide:	none applied
Previous Crop:	fallow
Precipitation:	not measured

---

Table 4. Performance of 25 spring wheat cultivars tested under irrigation near Huntley, Montana during 2018  
Cultivars listed alphabetically. (Experiment 209909).

Cultivar	Yield 2020 bu/a	Yield 2018-20 bu/a	Yield 2017-20 bu/a	Test Weight lb/bu	Grain Moisture %	Grain Protein %	Plant Height inches	Lodging 0 - 9	Heading Date
<u>Commercial</u>									
Alum	109.1	86.5	89.2	60.5	9.5	14.7	36.5	0	13-Jun
Brennan	112.3	93.5	92.6	62.8	9.5	14.7	33.3	0	11-Jun
Choteau	<b>119.0</b>	93.1	85.5	61.5	9.5	14.9	37.5	0	13-Jun
Corbin	107.6	80.7	81.1	60.7	9.7	14.5	38.1	0	10-Jun
Dagmar	113.8	102.2	-	62.4	9.8	16.1	38.6	0	12-Jun
Duclair	<b>119.2</b>	97.6	95.5	60.9	9.3	14.7	35.4	0	11-Jun
Egan	109.0	88.4	88.0	61.0	8.8	16.6	37.0	0	15-Jun
Fortuna	87.9	72.5	77.2	60.3	9.5	15.2	43.2	0	14-Jun
Lanning	<b>129.1</b>	100.8	97.3	62.1	9.1	15.8	34.6	0	10-Jun
LCS Pro	113.8	94.7	91.6	63.1	9.5	15.2	39.6	0	12-Jun
NS Presser	111.1	87.3	77.4	61.6	8.9	16.4	38.2	0	15-Jun
Reeder	102.0	90.1	91.8	63.1	9.4	15.8	38.3	0	13-Jun
SY Ingmar	106.8	93.1	94.5	62.9	9.4	15.2	34.6	0	15-Jun
SY Soren	113.1	92.6	94.1	63.0	9.5	15.1	33.5	0	12-Jun
Vida	103.3	87.1	85.5	59.9	9.5	15.4	36.4	0	14-Jun
WB Gunnison	107.6	85.7	86.8	61.8	9.9	13.6	32.9	0	12-Jun
WB9879CLP	<b>122.4</b>	95.6	88.6	62.5	9.4	14.5	38.8	0	14-Jun
<u>Experimental</u>									
CP3099	114.4	-	-	62.0	9.3	15.4	38.6	0	11-Jun
CP3530	115.2	-	-	62.8	9.4	14.5	33.5	0	12-Jun
CP3903	105.0	-	-	63.0	9.4	16.8	35.8	0	11-Jun
CP3910	116.4	-	-	60.9	9.2	14.6	29.4	0	10-Jun
CP3915	<b>122.7</b>	-	-	61.5	9.5	15.3	31.5	0	11-Jun
MT1716	111.4	-	-	62.2	9.7	15.0	37.3	0	11-Jun
MT1855	114.7	-	-	61.8	9.5	15.1	40.4	0	16-Jun
MT1866	108.3	-	-	60.7	9.5	15.6	38.6	0	13-Jun
Average	111.8	90.7	88.5	61.8	9.4	15.2	36.5	0	164.9
PLSD (p=0.05)	12.4	ns	ns	1.2	0.3	0.4	2.0		1.0
CV%	6.7	8.1	7.9	1.2	1.5	1.4	3.4		0.3
Lattice RE%	100	100	100	101	147	100	100		117.0

Yields are based on 60 pound standard bushel weight and adjusted to 13.0 percent moisture content. Two and three year averages based on 2017, 2018, and 2020.

Grain protein values adjusted to 12 percent grain moisture content.

**Bold** Indicates highest yielding cultivar within a column.

**Bold** 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 Irrigated Spring Wheat (Experiment 209909)

---

Planted:	March 30, 2020
Harvested:	August 14, 2020
Fertility:	100 lbs N broadcast fall 2019 + 100 lbs N broadcast at jointing stage (urea)
Herbicide:	RT3 24 oz/a pre-plant
Insecticide:	none
Previous Crop:	spring pea
Irrigation:	Applied a total of 5 inches through impact sprinkler on 6/3, 6/22 and 7/20
Precipitation:	March-July 8.7 inches
Irrigation:	Overhead sprinkler

---

Table 5. Performance of 25 spring wheat cultivars tested under irrigation near Hysham during 2020. Cultivars listed alphabetically. (Experiment 209996).

Cultivar	Yield 2020 bu/a	Yield 2019-20 bu/a	Yield 2018-20 bu/a	Test Weight lb/bu	Grain Moisture %	Grain Protein %	Plant Height inches	Lodging 0 - 9
<u>Commercial</u>								
Alum	91.5	71.9	72.5	59.7	8.8	14.9	35.3	1.0
Brennan	<b>108.6</b>	<b>82.5</b>	82.0	63.2	9.0	14.4	33.2	0.0
Choteau	104.4	<b>81.9</b>	<b>84.1</b>	60.6	8.8	14.7	37.1	1.3
Corbin	97.0	77.8	78.0	59.5	8.9	14.6	36.5	1.7
Dagmar	<b>109.3</b>	<b>91.5</b>	<b>92.3</b>	61.9	9.0	15.2	37.4	3.0
Duclair	<b>107.2</b>	<b>83.8</b>	82.8	60.9	8.8	14.6	35.7	0.0
Egan	95.0	78.5	80.4	61.5	8.7	16.2	38.5	0.7
Fortuna	81.7	63.0	67.9	60.5	8.8	14.7	43.4	6.7
Lanning	104.7	<b>88.6</b>	<b>89.5</b>	61.6	8.7	15.4	35.6	0.7
LCS Pro	102.4	80.3	80.4	62.5	9.1	14.4	40.8	1.0
NS Presser	98.5	73.9	79.7	61.3	8.8	15.9	38.3	0.0
Reeder	94.1	78.1	79.3	62.4	8.8	14.7	39.8	0.0
SY Ingmar	97.3	81.0	<b>84.9</b>	63.9	9.1	14.3	36.2	0.0
SY Soren	96.9	<b>82.3</b>	83.5	63.4	9.1	14.5	34.8	0.0
Vida	93.1	75.4	81.8	60.5	9.0	15.5	38.6	3.0
WB Gunnison	98.3	76.9	77.9	62.4	9.1	13.6	36.2	0.0
WB9879CLP	<b>111.6</b>	<b>89.2</b>	<b>88.5</b>	62.3	9.0	13.8	37.7	0.0
<u>Experimental</u>								
CP3099	<b>116.9</b>	-	-	61.1	9.2	12.5	40.6	0.0
CP3530	<b>111.6</b>	-	-	62.4	9.2	14.1	39.8	0.3
CP3903	94.8	-	-	64.0	9.0	15.0	36.9	0.0
CP3910	<b>112.8</b>	-	-	62.7	8.9	14.3	34.0	0.0
CP3915	<b>107.2</b>	-	-	63.4	9.3	13.9	35.8	0.0
MT1716	105.1	<b>86.0</b>	-	62.3	9.1	14.1	36.5	2.7
MT1855	104.3	-	-	61.6	9.1	14.1	40.8	0.3
MT1866	98.8	-	-	61.3	9.0	15.1	36.6	1.7
Average	101.7	80.1	81.5	61.9	9.0	14.6	37.4	1.0
PLSD (p=0.05)	10.4	9.9	8.6	1.5	0.3	1.1	2.6	1.5
CV%	6.2	7.8	7.8	1.5	2.1	4.6	4.0	94.0
Lattice RE%	100	100	100	100	100	100	100	100

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

Grain protein values adjusted to 12 percent grain moisture content.

Lodging severity scores of 0 to 9 represent no lodging to all stems flat on the ground, respectively.

**Bold** Indicates highest yielding cultivar within a column.

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

Hysham Irrigated Spring Wheat (Experiment 209996)

---

Planted: April 12, 2020  
Harvested: August 17, 2020  
Fertility: 130-0-0 lb/a NPK  
Herbicide: n/a  
Fungicide: n/a  
Previous Crop: Sugar beet  
Irrigation: flood

---

Table 6. Performance of 25 spring wheat cultivars tested under irrigation near Fromberg, Montana during 2020. Cultivars listed alphabetically. (Experiment 209997).

Cultivar	Yield 2020 bu/a	Yield 2019-20 bu/a	Yield 2018-20 bu/a	Test Weight lb/bu	Grain Moisture %	Grain Protein %	Plant Height inches	Lodging 0 - 9
<u>Commercial</u>								
Alum	122.7	111.0	<b>104.8</b>	63.8	10.5	12.8	39.5	2.2
Brennan	115.9	103.2	<b>98.1</b>	65.2	9.7	13.8	36.5	0.8
Choteau	117.6	107.9	<b>101.1</b>	63.7	10.0	13.3	37.9	2.0
Corbin	117.9	103.4	95.6	63.3	9.9	13.5	40.7	3.2
Dagmar	120.5	112.3	<b>106.8</b>	64.0	10.0	13.6	39.6	3.5
Duclair	<b>129.5</b>	114.4	<b>104.3</b>	63.3	9.8	12.9	39.8	1.6
Egan	105.0	98.7	92.9	63.0	9.4	15.5	40.7	1.9
Fortuna	106.1	91.8	89.2	63.3	9.9	13.8	45.9	7.0
Lanning	108.7	104.9	95.2	63.8	9.4	14.1	39.5	0.1
LCS Pro	114.4	102.5	91.2	64.7	9.9	13.1	43.4	1.1
NS Presser	109.5	100.1	93.9	63.1	9.5	15.7	41.2	1.6
Reeder	98.1	96.8	91.8	64.3	9.6	13.3	43.2	1.8
SY Ingmar	113.4	105.7	97.1	64.8	9.8	14.0	37.5	0.3
SY Soren	109.3	102.8	95.9	65.2	9.8	13.8	36.9	0.5
Vida	105.4	106.5	<b>100.5</b>	62.4	10.6	13.2	41.2	3.5
WB Gunnison	114.3	102.9	<b>97.9</b>	64.0	10.2	13.0	37.3	0.8
WB9879CLP	125.7	114.5	<b>108.0</b>	64.7	9.9	13.1	39.0	1.1
<u>Experimental</u>								
CP3099	<b>128.8</b>	-	-	60.7	9.9	12.0	43.7	0.2
CP3530	<b>136.1</b>	-	-	64.2	10.0	12.7	40.8	0.7
CP3903	107.1	-	-	65.9	9.8	13.5	39.5	0.1
CP3910	<b>130.8</b>	-	-	65.1	9.7	13.0	35.8	1.0
CP3915	<b>128.6</b>	-	-	64.5	10.0	13.4	40.3	0.0
MT1716	115.4	110.3	-	63.8	10.2	13.2	39.0	6.1
MT1855	109.8	-	-	62.0	10.6	13.2	42.1	2.2
MT1866	111.4	-	-	63.5	9.9	13.1	42.1	4.1
Average	116.1	105.0	97.9	63.8	9.9	13.5	40.1	1.9
PLSD (p=0.05)	9.6	ns	10.2	1.4	0.6	0.7	2.3	2.1
CV%	4.7	6.0	6.3	1.3	4.0	2.8	3.4	63.1
Lattice RE%	109	100	100	100	100	154	100	109

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

Grain protein values adjusted to 12 percent grain moisture content.

Lodging severity scores of 0 to 9 represent no lodging to all stems flat on the ground, respectively.

**Bold** Indicates highest yielding cultivar within a column.

**Bold** 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 Wheat (Experiment 209997)

Planted: March 27, 2020  
 Harvested: August 10, 2020  
 Fertility: 100-0-25-20 N-P-K-S lb/a  
 Herbicide: n/a  
 Insecticide/Fungicide: n/a  
 Previous Crop: Sugar beat

Table 7. Grain yield (bushels per acre) of spring wheat cultivars tested at six locations in south central Montana during 2020. Varieties listed by declining overall average yield (last column).

Cultivar	Dryland Huntley	Dryland Broadview	Dryland Billings	Dryland Average	Irrigated Huntley	Irrigated Hysham	Irrigated Fromberg	Irrigated Average	Overall Average
WB 9879CLP	<b>83.8</b>	45.6	<b>59.2</b>	<b>63.8</b>	<b>122.4</b>	<b>111.6</b>	125.7	<b>120.0</b>	<b>91.9</b>
Duclair	78.4	47.7	<b>62.7</b>	<b>63.1</b>	<b>119.2</b>	<b>107.2</b>	<b>129.5</b>	<b>118.4</b>	<b>90.8</b>
CP3099	74.0	<b>52.5</b>	53.5	<b>60.1</b>	114.4	<b>116.9</b>	<b>128.8</b>	<b>120.4</b>	<b>90.2</b>
Dagmar	<b>88.6</b>	46.5	<b>62.0</b>	<b>65.6</b>	113.8	<b>109.3</b>	120.5	<b>114.6</b>	<b>90.1</b>
CP3530	67.6	<b>51.2</b>	<b>59.0</b>	<b>59.1</b>	115.2	<b>111.6</b>	<b>136.1</b>	<b>120.7</b>	<b>89.9</b>
CP3915	70.4	47.9	<b>59.8</b>	58.6	<b>122.7</b>	<b>107.2</b>	<b>128.6</b>	<b>119.6</b>	<b>89.1</b>
Choteau	<b>84.1</b>	45.3	<b>58.8</b>	<b>62.7</b>	<b>119.0</b>	104.4	117.6	<b>114.2</b>	<b>88.5</b>
MT1716	<b>89.9</b>	47.2	<b>63.1</b>	<b>66.3</b>	111.4	105.1	115.4	110.7	<b>88.5</b>
CP3910	56.3	45.8	<b>61.5</b>	54.1	116.4	<b>112.8</b>	<b>130.8</b>	<b>120.1</b>	<b>87.1</b>
MT1855	<b>85.6</b>	46.5	<b>59.9</b>	<b>64.0</b>	114.7	104.3	109.8	110.0	<b>87.0</b>
Lanning	70.7	47.0	<b>58.9</b>	<b>59.3</b>	<b>129.1</b>	104.7	108.7	<b>114.3</b>	<b>86.8</b>
LCS Pro	<b>83.9</b>	44.5	<b>59.2</b>	<b>61.9</b>	113.8	102.4	114.4	109.8	<b>85.8</b>
MT1866	<b>83.2</b>	<b>50.4</b>	<b>60.6</b>	<b>64.8</b>	108.3	98.8	111.4	106.4	<b>85.6</b>
Alum	73.1	<b>50.6</b>	<b>61.7</b>	<b>61.9</b>	109.1	91.5	122.7	107.8	<b>84.9</b>
SY Soren	79.0	45.3	57.0	<b>60.6</b>	113.1	96.9	109.3	106.9	83.7
Vida	<b>87.1</b>	<b>50.3</b>	<b>62.0</b>	<b>66.8</b>	103.3	93.1	105.4	100.2	83.5
NS Presser CLP	77.4	43.8	<b>60.3</b>	<b>61.1</b>	111.1	98.5	109.5	106.0	83.5
Brennan	66.9	37.5	57.0	54.2	112.3	<b>108.6</b>	115.9	<b>112.6</b>	83.4
WB Gunnison	74.5	46.9	53.8	<b>59.2</b>	107.6	98.3	114.3	106.4	82.8
Corbin	71.8	<b>48.9</b>	53.0	57.9	107.6	97.0	117.9	107.3	82.6
Egan	80.7	45.4	<b>60.9</b>	<b>61.4</b>	109.0	95.0	105.0	103.3	82.4
SY Ingmar	76.9	42.1	56.3	57.9	106.8	97.3	113.4	106.0	82.0
CP3903	72.9	37.3	52.7	54.0	105.0	94.8	107.1	102.3	78.2
Reeder	74.2	44.4	56.2	58.5	102.0	94.1	98.1	97.3	77.9
Fortuna	68.1	46.5	53.1	55.6	87.9	81.7	106.1	91.3	73.5
Average	76.7	46.3	58.5	60.5	111.8	101.7	116.1	109.9	85.2
LSD	7.9	3.8	4.6	8.1	12.4	10.4	9.6	8.1	7.2
CV%	6.0	4.5	4.8	6.3	6.7	6.2	4.7	6.1	6.4

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

**Underline** Indicates highest yielding cultivar within a column.

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

Table 8. Performance of spring wheat cultivars tested under both dryland and irrigated conditions at six locations in south central Montana during 2020. Cultivars listed alphabetically.

Cultivar	Yield 2020 bu/a	Yield 2019-20 bu/a	Yield 2018-20 bu/a	Test Weight lb/bu	Grain Moisture %	Grain Protein %	Plant Height inches	Lodging 0 - 9
<u>Commercial</u>								
Alum	<b>84.9</b>	80.0	74.6	61.9	9.6	13.4	34.6	0.5
Brennan	83.4	79.1	74.7	63.8	9.4	14.4	31.8	0.1
Choteau	<b>88.5</b>	<b>83.5</b>	78.6	62.3	9.5	13.9	34.8	0.6
Corbin	82.6	78.4	72.9	62.2	9.6	13.9	35.4	0.8
CP3099	<b>90.2</b>	-	-	60.2	9.5	13.0	38.6	0.2
Dagmar	<b>90.1</b>	<b>88.4</b>	<b>84.4</b>	62.8	9.7	14.4	35.8	1.2
Duclair	<b>90.8</b>	<b>85.7</b>	80.0	62.1	9.4	13.6	34.8	0.3
Egan	82.4	78.9	74.6	61.5	9.1	15.5	35.7	0.4
Fortuna	73.5	68.4	66.5	61.8	9.5	14.0	42.2	2.8
Lanning	<b>86.8</b>	<b>84.6</b>	79.1	62.8	9.2	14.5	33.8	0.1
LCS Pro	<b>85.8</b>	80.8	75.1	63.2	9.6	13.9	38.1	0.6
NS Presser	83.5	78.8	75.5	61.6	9.1	15.5	35.5	0.2
Reeder	77.9	76.9	73.8	63.2	9.4	14.0	37.1	0.3
SY Ingmar	82.0	79.7	76.3	63.6	9.6	14.2	33.6	0.1
SY Soren	83.7	80.9	76.1	63.6	9.5	14.2	32.4	0.1
Vida	83.5	82.0	78.7	61.7	9.7	13.7	35.5	1.1
WB Gunnison	82.8	78.3	73.9	62.8	9.7	13.1	33.1	0.1
WB9879CLP	<b>91.9</b>	<b>86.9</b>	<b>81.4</b>	63.0	9.4	13.8	35.0	0.2
<u>Experimental</u>								
CP3530	<b>89.9</b>	-	-	62.9	9.6	13.7	35.1	0.2
CP3903	78.2	-	-	63.7	9.4	14.4	35.2	0.1
CP3910	<b>87.1</b>	-	-	63.2	9.5	13.6	30.3	0.2
CP3915	<b>89.1</b>	-	-	63.2	9.7	14.1	32.7	0.0
MT1716	<b>88.5</b>	<b>85.6</b>	-	63.0	9.8	13.7	35.0	1.5
MT1855	<b>87.0</b>	-	-	61.9	9.7	13.5	38.2	0.4
MT1866	<b>85.6</b>	-	-	62.3	9.6	13.8	36.5	0.9
Average	85.2	80.9	76.2	62.6	9.5	14.0	35.2	0.5
PLSD (p=0.05)	7.2	4.9	4.1	1.0	0.2	0.6	1.5	1.0
CV%	6.4	7.1	7.4	1.0	2.2	3.2	3.7	129.4
Location x Year	6	9	14	6	6	6	6	6

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

Grain protein values adjusted to 12 percent grain moisture content.

Lodging severity scores of 0 to 9 represent no lodging to all stems flat on the ground, respectively.

**Bold** Indicates highest yielding cultivar within a column.

**Bold** 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 irrigated conditions in south central Montana during 2020. Cultivars listed alphabetically.

Cultivar	Yield 2020 bu/a	Yield 2019-20 bu/a	Yield 2018-20 bu/a	Test Weight lb/bu	Grain Moisture %	Grain Protein %	Plant Height inches	Lodging 0 - 9
<u>Commercial</u>								
Alum	107.8	95.0	88.2	61.3	9.6	14.1	37.1	1.0
Brennan	<b>112.6</b>	96.7	90.9	63.8	9.4	14.3	34.3	0.2
Choteau	<b>114.2</b>	<b>99.7</b>	92.7	61.9	9.4	14.2	37.5	1.1
Corbin	107.3	94.0	85.2	61.2	9.5	14.2	38.4	1.7
Dagmar	<b>114.6</b>	<b>104.3</b>	<b>100.2</b>	62.7	9.6	14.9	38.5	2.2
Duclair	<b>118.4</b>	<b>103.1</b>	<b>94.6</b>	61.7	9.3	14.1	37.0	0.6
Egan	103.3	92.7	87.1	61.9	9.0	16.1	38.7	0.9
Fortuna	91.3	79.5	77.1	61.4	9.4	14.6	44.2	4.6
Lanning	<b>114.3</b>	<b>103.2</b>	<b>94.4</b>	62.5	9.1	15.1	36.6	0.2
LCS Pro	109.8	95.9	88.0	63.4	9.5	14.3	41.3	0.9
NS Presser	106.0	91.8	86.9	62.0	9.1	16.0	39.2	0.4
Reeder	97.3	90.3	86.7	63.3	9.2	14.6	40.4	0.7
SY Ingmar	106.0	96.0	91.5	63.9	9.4	14.6	36.1	0.2
SY Soren	106.9	96.7	90.4	63.9	9.5	14.4	35.0	0.1
Vida	100.2	93.4	90.1	60.9	9.7	14.7	38.7	2.1
WB Gunnison	106.4	93.4	87.4	62.7	9.7	13.3	35.5	0.2
WB9879CLP	<b>120.0</b>	<b>106.0</b>	<b>97.6</b>	63.2	9.4	13.8	38.5	0.3
<u>Experimental</u>								
CP3099	<b>120.4</b>	-	-	61.3	9.5	13.2	40.9	0.0
CP3530	<b>120.7</b>	-	-	63.2	9.6	13.8	38.0	0.3
CP3903	102.3	-	-	64.3	9.4	15.1	37.4	0.0
CP3910	<b>120.1</b>	-	-	62.9	9.3	14.0	33.1	0.3
CP3915	<b>119.6</b>	-	-	63.2	9.6	14.2	35.9	0.0
MT1716	110.7	<b>100.8</b>	-	62.8	9.6	14.2	37.6	3.0
MT1855	110.0	-	-	61.8	9.7	14.2	41.1	0.9
MT1866	106.4	-	-	61.8	9.5	14.5	39.1	1.8
Average	109.9	96.3	89.9	62.5	9.4	14.4	38.0	1.0
PLSD (p=0.05)	8.1	6.9	6.1	1.1	0.3	0.8	2.1	1.7
CV%	6.1	7.1	7.3	1.3	2.9	3.5	3.6	97.0
Location x Year	3	5	8	3	3	3	3	3

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

Grain protein values adjusted to 12 percent grain moisture content.

Lodging severity scores of 0 to 9 represent no lodging to all stems flat on the ground, respectively.

**Bold** Indicates highest yielding cultivar within a column.

**Bold** 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 dryland conditions in south central Montana during 2020. Cultivars listed alphabetically.

Cultivar	Yield 2020 bu/a	Yield 2019-20 bu/a	Yield 2018-20 bu/a	Test Weight lb/bu	Grain Moisture %	Grain Protein %	Plant Height inches
<u>Commercial</u>							
Alum	<b>61.9</b>	61.2	56.6	62.5	9.6	12.8	32.1
Brennan	54.2	57.0	53.0	63.8	9.5	14.6	29.2
Choteau	<b>62.7</b>	<b>63.2</b>	<b>59.9</b>	62.6	9.5	13.5	32.0
Corbin	57.9	58.9	56.4	63.2	9.7	13.6	32.4
Dagmar	<b>65.6</b>	<b>68.6</b>	<b>63.4</b>	62.9	9.7	13.9	33.1
Duclair	<b>63.1</b>	<b>64.0</b>	<b>60.7</b>	62.4	9.6	13.1	32.5
Egan	<b>61.4</b>	61.8	57.8	61.2	9.1	14.8	32.6
Fortuna	55.6	54.5	52.3	62.1	9.5	13.5	40.2
Lanning	<b>59.3</b>	61.4	58.6	63.0	9.4	14.0	31.1
LCS Pro	<b>61.9</b>	61.9	57.9	63.0	9.7	13.6	34.9
NS Presser	<b>61.1</b>	62.7	<b>60.3</b>	61.2	9.2	15.0	31.7
Reeder	58.5	60.1	56.6	63.0	9.5	13.4	33.8
SY Ingmar	57.9	59.3	56.0	63.3	9.7	13.7	31.2
SY Soren	<b>60.6</b>	61.2	57.1	63.3	9.5	13.9	29.8
Vida	<b>66.8</b>	<b>67.7</b>	<b>63.5</b>	62.5	9.7	12.8	32.2
WB Gunnison	<b>59.2</b>	59.3	56.0	62.9	9.7	12.9	30.7
WB9879CLP	<b>63.8</b>	<b>63.1</b>	<b>59.8</b>	62.9	9.5	13.8	31.4
<u>Experimental</u>							
CP3099	<b>60.1</b>	-	-	59.1	9.4	12.8	36.2
CP3530	<b>59.1</b>	-	-	62.6	9.6	13.6	32.1
CP3903	54.0	-	-	63.1	9.5	13.8	32.9
CP3910	54.1	-	-	63.4	9.6	13.3	27.6
CP3915	58.6	-	-	63.3	9.8	13.9	29.5
MT1716	<b>66.3</b>	<b>66.6</b>	-	63.3	9.9	13.1	32.5
MT1855	<b>64.0</b>	-	-	62.0	9.7	12.7	35.2
MT1866	<b>64.8</b>	-	-	62.8	9.7	13.1	33.9
Average	60.5	61.8	58.0	62.6	9.6	13.6	32.4
PLSD (p=0.05)	8.1	5.7	4.4	1.4	0.2	0.8	2.5
CV%	6.3	6.4	7.0	0.5	1.2	2.8	3.8
Location x Year	3	4	6	3	3	3	3

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

Grain protein values adjusted to 12 percent grain moisture content.

**Bold** Indicates highest yielding cultivar within a column.

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