PROJECT TITLE: Off-station spring wheat yield trials - 2000

OBJECTIVE: To evaluate varieties of spring wheat under irrigated and dryland conditions at various sites in eastern Montana.

PROJECT LEADER: Joyce Eckhoff, MSU Eastern Agricultural Research Center, Sidney, MT

Project Personnel:

County	Producers	CES Agents
Daniels, dryland	Bobbie Roos	Bobbie Roos
McCone, dryland	Victor Wagner	Nels Boe
Roosevelt, dryland	Mark Swank	Chet Hill
Roosevelt, irrigated	Richard Nygaard	Chet Hill
Sheridan, dryland	Max Aasheim	Terry Angvick
Sheridan, irrigated	Steve Brekke	Terry Angvick
Valley, dryland	Bill Lauckner	Verlin Koenig
Valley, irrigated	Kelly Donovan	Verlin Koenig
Wibaux, dryland	David Maus	Dave Bertelsen

MATERIALS AND METHODS: Twenty-four spring wheat varieties were planted at six dryland and three irrigated sites. Plots were 20 feet long and three feet wide, with one foot between rows. Entire plots were harvested using a plot combine. Planting and harvest dates were

Location	Planted	Harvested
Scobey, Daniels County – dryland	3 May	not harvested
Circle, McCone County – dryland	21 April	14 August
Poplar, Roosevelt County – dryland	2 May	15 August
Poplar, Roosevelt County – irrigated	2 May	18 August
Reserve, Sheridan County – dryland	2 May	21 August
Dagmar, Sheridan County – irrigated	2 May	21 August
Nashua, Valley County – dryland	19 April	16 August
Larslan, Valley County – irrigated	19 April	not harvested
Wibaux, Wibaux County – dryland	27 April	17 August

RESULTS: Summaries of yields, test weights, heights and protein contents across **dryland sites** are shown in Tables 1-4, and summaries of yields, test weights, heights and protein contents across **irrigated sites** are shown in Tables 25-28. McVey, GM50004, and 377S yielded most across dryland sites (Table 1). McVey and Reeder yielded most across irrigated sites (Table 25). Much disease was noted in the irrigated plots, resulting in low yields and test weights.

McCone County: Relative performance and economic values of spring wheat varieties at **Circle** are shown in Tables 5-8. Conan, Alsen, and Reeder produced the greatest economic return.

Wibaux County: Relative performance and economic values of spring wheat varieties at **Wibaux** are shown in Tables 9-12. Scholar and Amidon produced the greatest economic return.

Roosevelt County (dryland): Relative performance and economic values of spring wheat varieties at **Poplar** are shown in Tables 13-16. Reeder produced the greatest economic return.

Sheridan County (dryland): Relative performance and economic values of spring wheat varieties at **Reserve** are shown in Tables 17-20. Reeder produced the greatest economic return.

Valley County (dryland): Relative performance and economic values of spring wheat varieties at **Nashua** are shown in Tables 21-24. McNeal produced the greatest economic return.

Roosevelt County (irrigated): Relative performance and economic values of spring wheat varieties at **Poplar** are shown in Tables 29. Reeder produced the greatest economic return.

Sheridan County (irrigated): Relative performance and economic values of spring wheat varieties at **Dagmar** are shown in Tables 30-33. Reeder produced the greatest economic return.

SUMMARY: The off-station yield trials are conducted at several sites in eastern Montana. These trials provide important information about performance in the Mondak region of experimental lines from Montana and North Dakota, and new varieties from state breeding programs and private companies. Regional spring wheat producers make decisions on which varieties to grow based on data from these trials.

FUTURE PLANS: Off-station spring wheat yield trials will continue indefinitely. Expansion to other locations in future years is possible.

Table 1. Summary of spring wheat yields in bu/acre at five dryland off-station sites in eastern Montana, 2000.

Variety	Circle	Wibaux	Poplar	Reserve	Nashua	average
McVey	**30.1**	43.7	**67.5**	**42.0**	72.6	51.2
GM50004	28.4	45.8	62.6	32.6	76.2	49.1
377S*	24.6	47.6	61.2	35.1	**76.3**	49.0
Amidon	26.7	46.7	62.4	39.6	64.8	48.0
Reeder	27.0	45.1	66.4	38.2	61.9	47.7
MT9955	24.6	43.3	62.6	35.2	71.3	47.4
McNeal	25.3	45.2	58.4	36.8	65.7	46.3
Scholar	28.4	46.9	58.9	32.8	61.3	45.7
Parshall	26.1	42.4	61.3	38.3	59.5	45.5
GM50002	26.9	**47.7**	59.4	29.4	63.5	45.4
MTHW9420*	24.5	42.7	55.5	32.9	70.0	45.1
GM40003*	28.5	37.9	58.4	30.9	70.0	45.1
Ernest	26.7	40.1	62.9	35.0	59.8	44.9
Alsen	27.1	42.0	57.4	32.6	59.4	43.7
Bounty	24.8	44.8	54.6	31.8	61.4	43.5
Verde	26.0	41.9	58.4	30.9	56.6	42.8
Argent*	22.3	41.2	54.8	32.8	55.8	41.4
GM40002*	24.4	41.5	54.1	26.2	59.6	41.2
ND709-9	24.4	37.1	56.7	32.3	54.9	41.1
Conan	27.5	33.6	51.7	28.4	60.0	40.2
GM50010	23.0	42.4	49.9	21.8	63.1	40.0
GM40019*	26.0	35.6	53.1	22.7	56.7	38.8
MTHW9710*	20.1	36.5	52.8	26.6	53.0	37.8
GM40020*	20.7	30.9	49.3	24.7	59.6	37.0
Tioga	--	--	--	--	51.0	
Gunner	--	--	--	34.4	--	
Mercury	--	36.3	--	--	--	
Dandy	--	33.4	--	--	--	
site average	25.6	41.8	57.9	32.1	62.6	
p value	<0.001	<0.001	0.002	<0.001	<0.001	
CV (S/Mean)	8.1	7.7	8.9	11.4	8.4	
CV(SE/Mean)	4.7	4.5	5.1	6.6	4.8	
$LSD_{0.05}$	3.4	5.3	8.4	6.0	8.6	

*hard white wheat

Table 2. Summary of spring wheat test weights in lb/bu at five dryland off-station sites in eastern Montana, 2000.

Variety	Circle	Wibaux	Poplar	Reserve	Nashua	average
Alsen	64.0	63.7	63.7	62.5	64.8	63.7
ND709-9	62.6	63.5	63.5	62.3	63.5	63.1
Parshall	62.5	63.5	62.8	62.5	63.7	63.0
Reeder	62.3	63.3	63.0	61.7	63.5	62.8
GM40003*	62.5	64.0	63.3	60.7	63.7	62.8
Argent*	62.0	63.3	63.0	61.5	63.0	62.6
Ernest	62.2	63.0	63.0	61.0	63.0	62.4
GM40020*	62.2	64.3	63.0	58.8	63.5	62.4
GM40002*	61.9	64.0	62.3	59.7	63.7	62.3
Scholar	62.7	62.3	61.8	61.2	63.0	62.2
Verde	62.0	62.7	61.8	61.0	63.0	62.1
GM40019*	62.3	63.2	61.0	60.7	63.3	62.1
Conan	62.3	63.0	61.3	61.0	63.0	62.1
377S*	61.8	62.2	60.7	61.0	63.5	61.8
Amidon	61.5	62.0	62.2	60.8	62.7	61.8
GM50004	61.0	63.5	61.3	59.7	62.2	61.5
MT9955	60.3	62.5	61.5	60.5	62.8	61.5
MTHW9420*	62.2	62.8	60.3	59.0	63.0	61.5
McNeal	60.0	62.0	61.5	61.0	62.5	61.4
GM50002	60.8	62.2	60.3	60.2	62.7	61.2
McVey	60.0	61.8	61.0	60.5	62.0	61.1
Bounty	61.2	62.2	59.3	59.5	61.2	60.7
MTHW9710*	60.0	62.7	60.5	56.3	61.3	60.2
GM50010	58.6	62.0	58.8	57.2	61.3	59.6
Tioga	--	--	--	--	62.5	
Gunner	--	--	--	62.0	--	
Mercury	--	63.0	--	--	--	
Dandy	--	63.0	--	--	--	
site average	61.6	62.9	61.7	60.4	62.9	
p value	<0.001	<0.001	<0.001	<0.001	<0.001	
CV (S/Mean)	0.8	0.4	0.7	1.1	0.4	
CV(SE/Mean)	0.4	0.2	0.4	0.6	0.2	
$LSD_{0.05}$	0.8	0.4	0.7	1.1	0.4	

*hard white wheat

Table 3. Summary of spring wheat heights in inches at five dryland off-station sites in eastern Montana, 2000.

Variety	Circle	Wibaux	Poplar	Reserve	Nashua	average
Amidon	26.0	29.5	39.1	39.5	39.7	34.8
Parshall	27.7	28.2	37.3	37.4	40.4	34.2
Ernest	26.7	30.3	38.6	36.4	36.2	33.6
Scholar	27.4	28.4	37.3	36.1	37.1	33.3
Argent*	26.8	28.9	35.6	33.1	36.1	32.1
McVey	26.5	25.6	34.9	35.6	35.4	31.6
ND709-9	26.5	28.1	33.5	33.9	33.9	31.2
McNeal	24.9	25.6	35.0	33.6	32.8	30.4
Reeder	23.1	26.0	35.6	31.5	35.7	30.4
Verde	25.6	26.0	32.6	31.4	31.9	29.5
Alsen	23.5	26.5	33.6	31.0	32.4	29.4
GM50004	25.2	24.8	30.9	31.3	34.4	29.3
377S*	24.0	24.4	34.0	30.7	32.3	29.1
Conan	24.5	23.9	31.4	31.5	32.2	28.7
Bounty	23.1	23.5	32.4	30.5	30.4	28.0
MT9955	22.6	24.5	30.1	31.2	31.5	28.0
GM40002*	22.4	23.2	29.1	30.0	30.8	27.1
GM50002	21.5	23.5	30.6	29.1	30.3	27.0
MTHW9420*	23.8	23.2	30.4	28.5	29.3	27.0
GM40003*	22.8	22.8	29.4	29.9	27.7	26.5
MTHW9710*	21.7	21.1	30.6	28.6	29.0	26.2
GM40019*	19.8	21.0	28.2	24.8	28.6	24.5
GM40020*	21.5	22.1	26.0	25.2	26.5	24.3
GM50010	20.6	21.5	23.8	23.5	24.1	22.7
Tioga	--	--	--	--	36.2	
Mercury	--	19.7	--	--	--	
Dandy	--	24.4	--	--	--	
site average		25.1	32.5		32.6	
p value	<0.001	<0.001	<0.001		<0.001	
CV (S/Mean)		5.6	6.2		4.5	
CV(SE/Mean)		3.2	3.6		2.6	
$LSD_{0.05}$		2.3	3.3		2.4	

*hard white wheat

Table 4. Summary of spring wheat grain protein contents as percent at five dryland off-station sites in eastern Montana, 2000. Proteins are standardized to 13.5% moisture.

Variety	Circle	Wibaux	Poplar	Reserve	Nashua	average
Reeder	11.2	18.1	16.1	13.6	11.3	14.1
Parshall	10.6	18.6	15.8	13.1	10.6	13.7
Alsen	10.7	18.9	15.6	12.8	10.6	13.7
Argent*	10.8	18.8	15.5	13.0	10.6	13.7
Verde	11.4	16.9	13.4	12.8	12.9	13.5
MTHW9710*	11.8	16.9	14.5	12.6	11.0	13.4
ND709-9	11.3	18.3	14.1	12.6	10.2	13.3
Ernest	11.0	17.3	14.3	12.1	10.5	13.0
Conan	10.6	16.2	14.9	12.5	10.0	12.8
Scholar	9.4	16.6	14.2	11.9	10.7	12.6
GM50010	10.7	15.8	13.7	12.1	10.8	12.6
Amidon	10.1	17.0	13.5	11.9	10.1	12.5
GM40020*	10.8	16.3	12.9	11.2	9.6	12.2
McNeal	9.8	15.8	12.9	11.2	10.5	12.0
MT9955	10.0	16.0	13.6	11.1	9.4	12.0
MTHW9420*	9.9	16.1	12.8	11.6	9.7	12.0
GM40019*	10.9	15.4	13.0	11.1	9.8	12.0
377S*	9.3	15.6	13.3	11.1	10.1	11.9
Bounty	9.6	15.6	13.1	10.8	8.9	11.6
GM40003*	10.1	16.1	12.6	10.7	8.3	11.6
GM50004	8.8	15.2	12.7	11.1	9.6	11.5
GM40002*	10.0	16.0	12.2	10.5	8.2	11.4
McVey	8.6	14.5	12.3	10.8	8.7	11.0
GM50002	8.9	13.6	11.4	9.7	7.6	10.2
Tioga	--	--	--	--	12.1	
Gunner	--	--	--	13.2	--	
Mercury	--	17.5	--	--	--	
Dandy	--	16.9	--	--	--	
site average	10.3	16.5	13.7	11.8	10.1	
p value	<0.001	<0.001	<0.001	<0.001	<0.001	
CV (S/Mean)	5.7	1.8	1.7	3.2	7.9	
CV(SE/Mean)	3.3	1.0	1.0	1.9	4.6	
$LSD_{0.05}$	1.0	0.5	0.4	0.6	1.3	

*hard white wheat

Table 5. Performance of spring wheat grown under dryland continuous cropping conditions at Circle, MT. Planted: 21 April 2000 Harvested: 21 August 2000 Cooperator: Victor Wagner

Variety	Height, inches	Grain protein	Test weight	Yield, bu/acre	$/acre[1] +/- McNeal
Conan	24.5	10.6	62.3	27.5	34.10
Alsen	23.5	10.7	64.0	27.1	32.50
Reeder	23.1	11.2	62.3	27.0	32.10
Ernest	26.7	11.0	62.2	26.7	30.90
Amidon	26.0	10.1	61.5	26.7	30.90
Parshall	27.7	10.6	62.5	26.1	28.50
Verde	25.6	11.4	62.0	26.0	28.10
MT9955	22.6	10.0	60.3	24.6	22.50
ND709-9	26.5	11.3	62.6	24.4	21.70
GM50010	20.6	10.7	58.6	23.0	16.10
McVey	26.5	8.6	60.0	30.1	14.40
GM50004	25.2	8.8	61.0	28.4	9.30
Scholar	27.4	9.4	62.7	28.4	9.30
GM50002	21.5	8.9	60.8	26.9	4.80
McNeal	24.9	9.8	60.0	25.3	0.00
Bounty	23.1	9.6	61.2	24.8	-1.50
GM40003*	22.8	10.1	62.5	28.5	*
GM40019*	19.8	10.9	62.3	26.0	*
ID377S*	24.0	9.3	61.8	24.6	*
MTHW9420*	23.8	9.9	62.2	24.5	*
GM40002*	22.4	10.0	61.9	24.4	*
Argent*	26.8	10.8	62.0	22.3	*
GM40020*	21.5	10.8	62.2	20.7	*
MTHW9710*	21.7	11.8	60.0	20.1	*
average	24.1	10.3	61.6	25.6	
p value	<0.001	<0.001	<0.001	<0.001	
CV (S/Mean)	8.5	5.7	0.8	8.1	
CV(SE/Mean)	4.9	3.3	0.4	4.7	
LSD 0.05	3.4	1.0	0.8	3.4	

[1]Wheat prices summarized by Gregg Carlson, NARC, Havre, MT, from 5-year average of daily market values for PNW, supplied by the Montana Wheat and Barley Committee

** No average price for hard white wheat available at this time.

Table 6. Relative yielding abilities of spring wheat varieties as compared to McNeal when grown under dryland conditions in McCone County in cooperation with CES.
Cooperator: Victor Wagner

Cultivar	1996	1997	1998	1999	2000	Ave	as % of McNeal
McVey	--	--	--	--	30.1	30.1	119.0
GM40003	--	--	--	--	28.5	28.5	112.6
GM50004	--	--	--	--	28.4	28.4	112.3
Amidon	19.5	21.3	44.6	49.5	26.7	32.3	111.6
Reeder	--	--	47.6	45.6	27.0	40.1	109.1
Alsen	--	--	--	--	27.1	27.1	107.1
GM50002	--	--	--	--	26.9	26.9	106.3
GM40019	--	--	--	--	26.0	26.0	102.8
McNeal	16.2	18.4	41.2	43.7	25.3	29.0	100.0
Scholar	--	23.6	35.3	40.6	28.4	32.0	99.5
Bounty	--	--	--	--	24.8	24.8	98.0
MT9955	--	--	--	--	24.6	24.6	97.2
ND709-9	--	--	--	--	24.4	24.4	96.4
GM40002	--	--	--	--	24.4	24.4	96.4
Parshall	--	--	37.7	42.3	26.1	35.4	96.3
Verde	--	20.1	35.1	--	26.0	27.1	95.6
Ernest	17.7	19.9	36.5	37.2	26.7	27.6	95.3
Conan	--	--	--	36.2	27.5	31.9	92.3
377S	--	--	--	38.6	24.6	31.6	91.6
GM50010	--	--	--	--	23.0	23.0	90.9
Argent	--	--	36.8	39.8	22.3	33.0	89.7
MTHW9420	--	17.5	31.3	40.2	24.5	28.4	88.3
GM40020	--	--	--	--	20.7	20.7	81.8
MTHW9710	--	--	--	--	20.1	20.1	79.4

NOTE: Average yields in this summary should not be compared to each other since they are not grown in the same years. Compare yields only to the check variety.

Table 7. Relative test weights of spring wheat varieties as compared to McNeal when grown under dryland conditions in McCone County in cooperation with CES.
Cooperator: Victor Wagner

Cultivar	1996	1997	1998	1999	2000	Ave	as % of McNeal
Alsen	--	--	--	--	64.0	64.0	106.7
ND709-9	--	--	--	--	62.6	62.6	104.3
GM40003	--	--	--	--	62.5	62.5	104.2
GM40019	--	--	--	--	62.3	62.3	103.8
GM40020	--	--	--	--	62.2	62.2	103.7
Argent	--	--	62.8	63.3	62.0	62.7	103.5
Ernest	63.0	64.4	61.8	62.3	62.2	62.7	103.5
Conan	--	--	--	62.8	62.3	62.6	103.4
Verde	--	64.6	61.3	--	62.0	62.6	103.3
Scholar	--	63.6	61.2	63.3	62.7	62.7	103.3
Parshall	--	--	62.1	63.0	62.5	62.5	103.2
GM40002	--	--	--	--	61.9	61.9	103.2
377S	--	--	--	63.0	61.8	62.4	103.1
MTHW9420	--	64.4	60.5	63.2	62.2	62.6	103.0
Reeder	--	--	61.7	63.0	62.3	62.3	102.9
Amidon	62.4	63.2	61.5	61.7	61.5	62.1	102.3
Bounty	--	--	--	--	61.2	61.2	102.0
GM50004	--	--	--	--	61.0	61.0	101.7
GM50002	--	--	--	--	60.8	60.8	101.3
MT9955	--	--	--	--	60.3	60.3	100.5
McNeal	60.3	61.2	60.7	61.0	60.0	60.6	100.0
McVey	--	--	--	--	60.0	60.0	100.0
MTHW9710	--	--	--	--	60.0	60.0	100.0
GM50010	--	--	--	--	58.6	58.6	97.7

NOTE: Average test weights in this summary should not be compared to each other since they are not grown in the same years. Compare test weights only to the check variety.

Table 8. Relative protein contents of spring wheat varieties as compared to McNeal when grown under dryland conditions in McCone County in cooperation with CES.
Cooperator: Victor Wagner

Cultivar	1996	1997	1998	1999	2000	Ave	as % of McNeal
MTHW9710	--	--	--	--	11.8	11.8	120.4
Reeder	--	--	13.6	15.3	11.2	13.4	118.6
Parshall	--	--	13.6	14.9	10.6	13.0	115.7
ND709-9	--	--	--	--	11.3	11.3	115.3
Argent	--	--	14.0	13.4	10.8	12.7	113.0
Verde	--	13.8	13.7	--	11.4	13.0	111.5
GM40019	--	--	--	--	10.9	10.9	111.2
GM40020	--	--	--	--	10.8	10.8	110.2
Alsen	--	--	--	--	10.7	10.7	109.2
GM50010	--	--	--	--	10.7	10.7	109.2
Ernest	12.8	14.0	13.8	13.8	11.0	13.1	108.3
Scholar	--	13.7	14.0	13.8	9.4	12.7	107.6
Conan	--	--	--	12.9	10.6	11.8	105.9
GM40003	--	--	--	--	10.1	10.1	103.1
MT9955	--	--	--	--	10.0	10.0	102.0
GM40002	--	--	--	--	10.0	10.0	102.0
Amidon	11.6	13.5	12.5	13.4	10.1	12.2	101.2
McNeal	13.1	13.5	11.6	12.4	9.8	12.1	100.0
MTHW9420	--	13.8	12.3	11.0	9.9	11.8	99.4
Bounty	--	--	--	--	9.6	9.6	98.0
377S	--	--	--	11.6	9.3	10.5	94.1
GM50002	--	--	--	--	8.9	8.9	90.8
GM50004	--	--	--	--	8.8	8.8	89.8
McVey	--	--	--	--	8.6	8.6	87.8

NOTE: Average protein contents in this summary should not be compared to each other since they are not grown in the same years. Compare protein contents only to the check variety.

Table 9. Performance of spring wheat grown under dryland conditions at Wibaux, MT.
Planted: 27 April 2000 Harvested: 17 August 2000 Cooperator: David Maus

Variety	Height, inches	Grain protein	Test weight	Yield, bu/acre	$/acre[1] +/- McNeal
Scholar	28.4	16.6	62.3	46.9	8.82
Amidon	29.5	17.0	62.0	46.7	7.78
GM50004	24.8	15.2	63.5	45.8	3.11
McNeal	25.6	15.8	62.0	45.2	0.00
Reeder	26.0	18.1	63.3	45.1	-.052
Bounty	23.5	15.6	62.2	44.8	-2.08
GM50002	23.5	13.6	62.2	47.7	-5.15
MT9955	24.5	16.0	62.5	43.3	-9.86
McVey	25.6	14.5	61.8	43.7	-12.16
Parshall	28.2	18.6	63.5	42.4	-14.53
GM50010	21.5	15.8	62.0	42.4	-14.53
Alsen	26.5	18.9	63.7	42.0	-16.61
Verde	26.0	16.9	62.7	41.9	-17.13
Ernest	30.3	17.3	63.0	40.1	-19.20
ND709-9	28.1	18.3	63.5	37.1	-26.47
Mercury	19.7	17.5	63.0	36.3	-46.19
Conan	23.9	16.2	63.0	33.6	-60.20
Dandy	24.4	16.9	63.0	33.4	-61.24
ID377S*	24.4	15.6	62.2	47.6	*
MTHW9420*	23.2	16.1	62.8	42.7	*
GM40002*	23.2	16.0	64.0	41.5	*
Argent*	28.9	18.8	63.3	41.2	*
GM40003*	22.8	16.1	64.0	37.9	*
MTHW9710*	21.1	16.9	62.7	36.5	*
GM40019*	21.0	15.4	63.2	35.6	*
GM40020*	22.1	16.3	64.3	30.9	*
average	25.1	16.5	62.9	41.8	
p value	<0.001	<0.001	<0.001	<0.001	
CV (S/Mean)	5.6	1.8	0.4	7.7	
CV(SE/Mean)	3.2	1.0	0.2	4.5	
LSD 0.05	2.3	0.5	0.4	5.3	

[1]Wheat prices summarized by Gregg Carlson, NARC, Havre, MT, from 6-year average of daily market values for PNW, supplied by the Montana Wheat and Barley Committee

** No average price for hard white wheat available at this time.

Table 10. Relative yielding abilities of spring wheat varieties as compared to McNeal when grown under dryland conditions in Wibaux County in cooperation with CES.
Cooperator: David Maus

Cultivar	1996	1997	1998	1999	2000	Ave	as % of McNeal
377S	--	--	--	35.0	47.6	41.3	110.6
Reeder	--	--	59.8	37.6	45.1	47.5	108.7
GM50002	--	--	--	--	47.7	47.7	105.5
Parshall	--	--	55.3	40.3	42.4	46.0	105.3
Verde	--	46.2	58.3	--	41.9	48.8	102.4
Scholar	--	43.5	51.0	34.8	46.9	44.1	102.1
Amidon	33.4	44.4	51.4	38.6	46.7	42.9	101.8
GM50004	--	--	--	--	45.8	45.8	101.3
McNeal	38.2	41.4	56.4	29.5	45.2	42.1	100.0
Bounty	--	--	--	--	44.8	44.8	99.1
Argent	--	--	54.1	33.7	41.2	43.0	98.4
McVey	--	--	--	--	43.7	43.7	96.7
MT9955	--	--	--	--	43.3	43.3	95.8
MTHW9420	--	37.1	52.6	32.0	42.7	41.1	95.3
GM50010	--	--	--	--	42.4	42.4	93.8
Ernest	37.0	34.5	49.5	35.2	40.1	39.3	93.2
Alsen	--	--	--	--	42.0	42.0	92.9
GM40002	--	--	--	--	41.5	41.5	91.8
Conan	--	--	--	30.8	33.6	32.2	86.2
GM40003	--	--	--	--	37.9	37.9	83.8
ND709-9	--	--	--	--	37.1	37.1	82.1
Mercury	--	--	--	--	36.6	36.6	81.0
MTHW9710	--	--	--	--	36.5	36.5	80.8
GM40019	--	--	--	--	35.6	35.6	78.8
Dandy	--	--	--	--	33.4	33.4	73.9
GM40020	--	--	--	--	30.9	30.9	68.4

NOTE: Average yields in this summary should not be compared to each other since they are not grown in the same years. Compare yields only to the check variety.

Table 11. Relative test weights of spring wheat varieties as compared to McNeal when grown under dryland conditions in Wibaux County in cooperation with CES.
Cooperator: David Maus

Cultivar	1996	1997	1998	1999	2000	Ave	as % of McNeal
GM40020	--	--	--	--	64.3	64.3	103.7
GM40002	--	--	--	--	64.0	64.0	103.2
GM40003	--	--	--	--	64.0	64.0	103.2
Parshall	--	--	61.0	61.1	63.5	61.9	103.0
Alsen	--	--	--	--	63.7	63.7	102.7
GM50004	--	--	--	--	63.5	63.5	102.4
ND709-9	--	--	--	--	63.5	63.5	102.4
Argent	--	--	61.2	59.6	63.3	61.4	102.2
Conan	--	--	--	59.9	63.0	61.5	102.1
GM40019	--	--	--	--	63.2	63.2	101.9
Reeder	--	--	60.5	59.7	63.3	61.2	101.8
Verde	--	60.2	60.8	--	62.7	61.2	101.8
Dandy	--	--	--	--	63.0	63.0	101.6
Mercury	--	--	--	--	63.0	63.0	101.6
Scholar	--	60.8	59.8	59.7	62.3	60.7	101.5
Ernest	62.0	59.8	60.3	58.5	63.0	60.7	101.3
MTHW9710	--	--	--	--	62.7	62.7	101.1
MT9955	--	--	--	--	62.5	62.5	100.8
Amidon	61.5	60.0	59.7	58.0	62.0	60.2	100.5
GM50002	--	--	--	--	62.2	62.2	100.3
Bounty	--	--	--	--	62.2	62.2	100.3
McNeal	60.8	58.7	59.8	58.4	62.0	59.9	100.0
GM50010	--	--	--	--	62.0	62.0	100.0
McVey	--	--	--	--	61.8	61.8	99.7
377S	--	--	--	57.3	62.2	59.8	99.3
MTHW9420	--	58.8	57.3	57.5	62.8	59.1	99.0

NOTE: Average test weights in this summary should not be compared to each other since they are not grown in the same years. Compare test weights only to the check variety.

Table 12. Relative protein contents of spring wheat varieties as compared to McNeal when grown under dryland conditions in Wibaux County in cooperation with CES.
Cooperator: David Maus

Cultivar	1996	1997	1998	1999	2000	Ave	as % of McNeal
Alsen	--	--	--	--	18.9	18.9	119.6
Argent	--	--	16.6	14.3	18.8	16.6	117.5
ND709-9	--	--	--	--	18.3	18.3	115.8
Parshall	--	--	16.8	12.7	18.6	16.0	113.7
Reeder	--	--	16.6	13.0	18.1	15.9	112.8
Mercury	--	--	--	--	17.5	17.5	110.8
Conan	--	--	--	13.4	16.2	14.8	107.2
MTHW9710	--	--	--	--	16.9	16.9	107.0
Dandy	--	--	--	--	16.9	16.9	107.0
Scholar	--	14.4	16.1	13.1	16.6	15.1	106.7
Ernest	12.0	14.6	15.5	13.7	17.3	14.6	106.1
377S	--	--	--	13.2	15.6	14.4	104.3
Amidon	11.7	14.2	15.3	13.6	17.0	14.4	104.2
GM40020	--	--	--	--	16.3	16.3	103.2
GM40003	--	--	--	--	16.1	16.1	101.9
MT9955	--	--	--	--	16.0	16.0	101.3
GM40002	--	--	--	--	16.0	16.0	101.3
McNeal	12.5	14.1	14.7	11.8	15.8	13.8	100.0
GM50010	--	--	--	--	15.8	15.8	100.0
MTHW9420	--	13.6	14.5	12.1	16.1	14.1	99.8
Bounty	--	--	--	--	15.6	15.6	98.7
Verde	--	12.4	14.5	--	16.9	14.6	98.2
GM40019	--	--	--	--	15.4	15.4	97.5
GM50004	--	--	--	--	15.2	15.2	96.2
McVey	--	--	--	--	14.5	14.5	91.8
GM50002	--	--	--	--	13.6	13.6	86.1

NOTE: Average proteins in this summary should not be compared to each other since they are not grown in the same years. Compare protein contents only to the check variety.

Table 13. Performance of spring wheat grown under dryland conditions at Poplar, MT.
Planted: 2 May 2000 Harvested: 15 August 2000 Cooperator: Mark Swank

Variety	Height, inches	Grain protein	Test weight	Yield, bu/acre	$/acre[1] +/- McNeal
Reeder	35.6	16.1	63.0	66.4	74.22
Parshall	37.3	15.8	62.8	61.3	47.76
Ernest	38.6	14.3	63.0	62.9	46.62
MT9955	30.1	13.6	61.5	62.6	30.71
Amidon	39.1	13.5	62.2	62.4	29.75
McVey	34.9	12.3	61.0	67.5	29.31
Alsen	33.6	15.6	63.7	57.4	27.51
Scholar	37.3	14.2	61.8	58.9	26.46
GM 50004	30.9	12.7	61.3	62.6	15.69
ND709-9	33.5	14.1	63.5	56.7	12.54
Verde	32.6	13.4	61.8	58.4	10.51
McNeal	35.0	12.9	61.5	58.4	0.00
Conan	31.4	14.9	61.3	51.7	-2.07
Bounty	32.4	13.1	59.3	54.6	-17.59
GM 50010	23.8	13.7	58.8	49.9	-25.88
GM 50002	30.6	11.4	60.3	59.4	-32.79
377S*	34.0	13.3	60.7	61.2	*
GM 40003*	29.4	12.6	63.3	58.4	*
MTHW9420*	30.4	12.8	60.3	55.5	*
Argent*	35.6	15.5	63.0	54.8	*
GM 40002*	29.1	12.2	62.3	54.1	*
GM 40019*	28.2	13.0	61.0	53.1	*
MTHW9710*	30.6	14.5	60.5	52.8	*
GM 40020*	26.0	12.9	63.0	49.3	*
average	32.5	13.7	61.7	57.9	
p value	<0.001	<0.001	<0.001	0.002	
CV (S/Mean)	6.2	1.8	0.7	8.9	
CV(SE/Mean)	3.6	1.0	0.4	5.1	
LSD 0.05	3.3	0.4	0.7	8.4	

[1]Wheat prices summarized by Gregg Carlson, NARC, Havre, MT, from 5-year average of daily market values for PNW, supplied by the Montana Wheat and Barley Committee

* No average price for hard white wheat available at this time.

Table 14. Relative yields of spring wheat varieties as compared to McNeal when grown under dryland conditions in Roosevelt County in cooperation with CES.
Cooperator: Mark Swank

Cultivar	1996	1997	1998	1999	2000	Ave	as % of McNeal
McVey	--	--	--	46.0	67.5	56.8	108.0
Reeder	--	--	50.7	49.8	66.4	55.6	107.9
MT9955	--	--	--	--	62.6	62.6	107.2
GM50004	--	--	--	--	62.6	62.6	107.2
GM50002	--	--	--	--	59.4	59.4	101.7
Amidon	25.8	26.5	49.7	43.8	62.4	41.6	101.5
McNeal	24.7	25.8	49.6	46.7	58.4	41.0	100.0
GM40003	--	--	--	--	58.4	58.4	100.0
377S	--	--	--	43.0	61.2	52.1	99.1
Scholar	--	25.5	48.1	45.3	58.9	44.5	98.5
Alsen	--	--	--	--	57.4	57.4	98.3
ND709-9	--	--	--	--	56.7	56.7	97.1
Parshall	--	--	40.0	47.4	61.3	49.6	96.1
Ernest	23.4	21.2	46.8	41.6	62.9	39.2	95.5
Verde	--	23.0	44.4	--	58.4	41.9	94.0
Bounty	--	--	--	--	54.6	54.6	93.5
GM40002	--	--	--	--	54.1	54.1	92.6
Argent	--	--	46.0	41.5	54.8	47.4	92.0
GM40019	--	--	--	--	53.1	53.1	90.9
MTHW9710	--	--	--	--	52.8	52.8	90.4
MTHW9420	--	18.3	39.3	44.6	55.5	39.4	87.4
GM50010	--	--	--	--	49.9	49.9	85.4
GM40020	--	--	--	--	49.3	49.3	84.4
Conan	--	--	--	35.4	51.7	43.6	82.9

NOTE: Average yields in this summary should not be compared to each other since they are not grown in the same years. Compare yields only to the check variety.

Table 15. Relative test weights of spring wheat varieties as compared to McNeal when grown under dryland conditions in Roosevelt County in cooperation with CES.
Cooperator: Mark Swank

Cultivar	1996	1997	1998	1999	2000	Ave	as % of McNeal
Alsen	--	--	--	--	63.7	63.7	103.6
ND709-9	--	--	--	--	63.5	63.5	103.3
Argent	--	--	62.8	61.7	63.0	62.5	103.0
GM40003	--	--	--	--	63.3	63.3	102.9
Reeder	--	--	63.0	61.0	63.0	62.3	102.7
Ernest	61.3	63.3	63.0	60.7	63.0	62.3	102.7
Parshall	--	--	62.8	61.0	62.8	62.2	102.5
GM40020	--	--	--	--	63.0	63.0	102.4
Scholar	--	62.8	62.3	60.5	61.8	61.9	101.9
GM40002	--	--	--	--	62.3	62.3	101.3
Amidon	60.3	62.0	61.7	60.0	62.2	61.2	101.0
MTHW9420	--	64.2	61.0	59.8	60.3	61.3	101.0
Verde	--	62.3	61.3	--	61.8	61.8	101.0
Conan	--	--	--	60.0	61.3	60.7	100.4
McNeal	60.3	60.8	61.3	59.3	61.5	60.6	100.0
MT9955	--	--	--	--	61.5	61.5	100.0
GM50004	--	--	--	--	61.3	61.3	99.7
377S	--	--	--	59.3	60.7	60.0	99.3
GM40019	--	--	--	--	61.0	61.0	99.2
McVey	--	--	--	58.2	61.0	59.6	98.7
MTHW9710	--	--	--	--	60.5	60.5	98.4
GM50002	--	--	--	--	60.3	60.3	98.0
Bounty	--	--	--	--	59.3	59.3	96.4
GM50010	--	--	--	--	58.8	58.8	95.6

NOTE: Average test weights in this summary should not be compared to each other since they are not grown in the same years. Compare test weights only to the check variety.

Table 16. Relative protein contents of spring wheat varieties as compared to McNeal when grown under dryland conditions in Roosevelt County in cooperation with CES.
Cooperator: Mark Swank

Cultivar	1996	1997	1998	1999	2000	Ave	as % of McNeal
Alsen	--	--	--	--	15.6	15.6	120.9
Parshall	--	--	16.8	15.6	15.8	16.1	119.0
Argent	--	--	16.1	15.6	15.5	15.7	116.5
Reeder	--	--	15.4	15.0	16.1	15.5	114.8
MTHW9710	--	--	--	--	14.5	14.5	112.4
Conan	--	--	--	14.7	14.9	14.8	112.1
ND709-9	--	--	--	--	14.1	14.1	109.3
GM50010	--	--	--	--	13.7	13.7	106.2
Scholar	--	15.2	15.2	14.8	14.2	14.9	105.7
MT9955	--	--	--	--	13.6	13.6	105.4
Ernest	14.0	15.6	15.0	14.8	14.3	14.7	104.7
377S	--	--	--	13.6	13.3	13.5	101.9
Bounty	--	--	--	--	13.1	13.1	101.6
GM40019	--	--	--	--	13.0	13.0	100.8
McNeal	14.2	15.7	14.1	13.5	12.9	14.1	100.0
Verde	--	14.8	14.5	--	13.4	14.2	100.0
GM40020	--	--	--	--	12.9	12.9	100.0
MTHW9420	--	15.0	13.9	13.9	12.8	13.9	98.9
GM50004	--	--	--	--	12.7	12.7	98.4
McVey	--	--	--	13.6	12.3	13.0	98.1
Amidon	13.4	14.6	13.4	14.1	13.5	13.8	98.0
GM40003	--	--	--	--	12.6	12.6	97.7
GM40002	--	--	--	--	12.2	12.2	94.6
GM50002	--	--	--	--	11.4	11.4	88.4

NOTE: Average protein contents in this summary should not be compared to each other since they are not grown in the same years. Compare protein contents only to the check variety.

Table 17. Performance of spring wheat grown under dryland conditions at Reserve, MT.
Planted: 2 May 2000 Harvested: 21 August 2000 Cooperator: Max Aasheim

Variety	Height, inches	Grain protein	Test weight	Yield, bu/acre	$/acre[1] +/- McNeal
Reeder	31.5	13.6	61.7	38.2	36.54
Parshall	37.4	13.1	62.5	38.3	30.13
McVey	35.6	10.8	60.5	42.0	20.80
Gunner	-	13.2	62.0	34.4	15.17
Amidon	39.5	11.9	60.8	39.6	11.20
Ernest	36.4	12.1	61.0	35.0	5.75
Alsen	31.0	12.8	62.5	32.6	1.78
McNeal	33.6	11.2	61.0	36.8	0.00
ND 709-9	33.9	12.6	62.3	32.3	-1.85
Scholar	36.1	11.9	61.2	32.8	-3.86
Verde	31.4	12.8	61.0	30.9	-5.99
MT 9955	31.2	11.1	60.5	35.2	-6.40
GM 50004	31.3	11.1	59.7	32.6	-16.80
Conan	31.5	12.5	61.0	28.4	-19.40
Bounty	30.5	10.8	59.5	31.8	-20.00
GM 50010	23.5	12.1	57.2	21.8	-51.93
GM 50002	29.1	9.7	60.2	29.4	-59.00
377S*	30.7	11.1	61.0	35.1	*
MTHW9420*	28.5	11.6	59.0	32.9	*
Argent*	33.1	13.0	61.5	32.8	*
GM 40003*	29.9	10.7	60.7	30.9	*
MTHW9710*	28.6	12.6	56.3	26.6	*
GM 40002*	30.0	10.5	59.7	26.2	*
GM 40020*	25.2	11.2	58.8	24.7	*
GM 40019*	24.8	11.1	60.7	22.7	*
average	31.4	11.8	60.4	32.1	
p value	<0.001	<0.001	<0.001	<0.001	
CV (S/Mean)	4.2	3.2	1.1	11.4	
CV(SE/Mean)	2.4	1.9	0.6	6.6	
LSD $_{0.05}$	2.2	0.6	1.1	6.0	

[1]Wheat prices summarized by Gregg Carlson, NARC, Havre, MT, from 5-year average of daily market values for PNW, supplied by the Montana Wheat and Barley Committee

** No average price for hard white wheat available at this time.

Table 18. Relative yielding abilities of spring wheat varieties as compared to McNeal when grown under dryland conditions in Sheridan County in cooperation with CES.
Cooperator: Max Aasheim

Cultivar	1996	1997	1998	1999	2000	Ave	as % of McNeal
McVey	--	--	--	49.7	42.0	45.9	123.8
Reeder	--	--	50.6	49.8	38.2	46.2	118.2
Parshall	--	--	36.9	42.3	38.3	39.2	100.2
McNeal	45.8	33.2	43.2	37.3	36.8	39.3	100.0
Scholar	--	33.6	46.2	36.2	32.8	37.2	98.9
Verde	--	33.0	47.0	--	30.9	37.0	98.0
Amidon	39.2	31.4	40.4	37.5	39.6	37.6	95.8
MT9955	--	--	--	--	35.2	35.2	95.7
Gunner	--	--	--	--	34.4	34.4	93.5
377S	--	--	--	33.5	35.1	34.3	92.6
Argent	--	--	37.2	37.3	32.8	35.8	91.5
Ernest	43.2	26.4	37.0	37.4	35.0	35.8	91.2
Alsen	--	--	--	--	32.6	32.6	88.6
GM50004	--	--	--	--	32.6	32.6	88.6
ND709-9	--	--	--	--	32.3	32.3	87.8
Bounty	--	--	--	--	31.8	31.8	86.4
GM40003	--	--	--	--	30.9	30.9	84.0
MTHW9420	--	19.2	39.4	31.5	32.9	30.8	81.7
Conan	--	--	--	32.1	28.4	30.3	81.6
GM50002	--	--	--	--	29.4	29.4	79.9
MTHW9710	--	--	--	--	26.6	26.6	72.3
GM40002	--	--	--	--	26.2	26.2	71.2
GM40020	--	--	--	--	24.7	24.7	67.1
GM40019	--	--	--	--	22.7	22.7	61.7
GM50010	--	--	--	--	21.8	21.8	59.2

NOTE: Average yields in this summary should not be compared to each other since they are not grown in the same years. Compare yields only to the check variety.

Table 19. Relative test weights of spring wheat varieties as compared to McNeal when grown under dryland conditions in Sheridan County in cooperation with CES.
Cooperator: Max Aasheim

Cultivar	1996	1997	1998	1999	2000	Ave	as % of McNeal
Parshall	--	--	62.3	63.7	62.5	62.8	102.9
Alsen	--	--	--	--	62.5	62.5	102.5
ND709-9	--	--	--	--	62.3	62.3	102.1
Gunner	--	--	--	--	62.0	62.0	101.6
Argent	--	--	61.5	63.0	61.5	62.0	101.5
Conan	--	--	--	62.8	61.0	61.9	101.5
Scholar	--	61.0	61.5	62.7	61.2	61.6	101.3
Reeder	--	--	60.7	63.2	61.7	61.9	101.3
Ernest	63.8	61.4	61.2	62.3	61.0	61.9	101.1
Verde	--	60.7	61.2	--	61.0	61.0	100.4
377S	--	--	--	61.3	61.0	61.2	100.2
Amidon	63.7	60.0	60.2	62.0	60.8	61.3	100.2
McNeal	63.0	60.0	61.2	61.0	61.0	61.2	100.0
GM40003	--	--	--	--	60.7	60.7	99.5
GM40019	--	--	--	--	60.7	60.7	99.5
McVey	--	--	--	60.7	60.5	60.6	99.3
MT9955	--	--	--	--	60.5	60.5	99.2
MTHW9420	--	60.6	58.7	61.8	59.0	60.0	98.7
GM50002	--	--	--	--	60.2	60.2	98.7
GM50004	--	--	--	--	59.7	59.7	97.9
GM40002	--	--	--	--	59.7	59.7	97.9
Bounty	--	--	--	--	59.5	59.5	97.5
GM40020	--	--	--	--	58.8	58.8	96.4
GM50010	--	--	--	--	57.2	57.2	93.8
MTHW9710	--	--	--	--	56.3	56.3	92.3

NOTE: Average test weights in this summary should not be compared to each other since they are not grown in the same years. Compare test weights only to the check variety.

Table 20. Relative protein contents of spring wheat varieties as compared to McNeal when grown under dryland conditions in Sheridan County in cooperation with CES.
Cooperator: Max Aasheim

Cultivar	1996	1997	1998	1999	2000	Ave	as % of McNeal
Parshall	--	--	15.8	15.0	13.1	14.6	119.3
Gunner	--	--	--	--	13.2	13.2	117.3
Argent	--	--	14.7	14.9	13.0	14.2	115.8
Conan	--	--	--	13.6	12.5	13.1	114.5
Alsen	--	--	--	--	12.8	12.8	114.3
Reeder	--	--	14.6	13.8	13.6	14.0	114.1
ND709-9	--	--	--	--	12.6	12.6	112.5
MTHW9710	--	--	--	--	12.6	12.6	112.5
GM50010	--	--	--	--	12.1	12.1	108.0
Ernest	14.4	14.2	14.8	13.6	12.1	13.8	107.1
Scholar	--	14.6	14.6	13.0	11.9	13.5	106.9
Amidon	14.0	13.6	13.3	13.1	11.9	13.2	102.2
MTHW9420	--	13.9	13.8	12.1	11.6	12.9	101.6
Verde	--	13.6	13.2	--	12.8	13.2	101.5
McNeal	13.9	13.8	14.0	11.6	11.2	12.9	100.0
GM40020	--	--	--	--	11.2	11.2	100.0
MT9955	--	--	--	--	11.1	11.1	99.1
GM50004	--	--	--	--	11.1	11.1	99.1
GM40019	--	--	--	--	11.1	11.1	99.1
377S	--	--	--	11.3	11.1	11.2	98.2
McVey	--	--	--	11.2	10.8	11.0	96.5
Bounty	--	--	--	--	10.8	10.8	96.4
GM40003	--	--	--	--	10.7	10.7	95.5
GM40002	--	--	--	--	10.5	10.5	93.8
GM50002	--	--	--	--	9.7	9.7	86.6

NOTE: Average protein contents in this summary should not be compared to each other since they are not grown in the same years. Compare protein contents only to the check variety.

Table 21. Performance of spring wheat grown under dryland conditions at Nashua, MT.
Planted: 19 April 2000, Harvested: 16 August 2000 Cooperator: Bill Lauckner

Variety	Height, inches	Grain protein	Test weight	Yield, bu/acre	$/acre[1] +/- McNeal
McNeal	32.8	10.5	62.5	65.7	0.00
Verde	31.9	12.9	63.0	56.6	-0.74
Amidon	39.7	10.1	62.7	64.8	-3.60
GM50010	24.1	10.8	61.3	63.1	-10.40
Reeder	35.7	11.3	63.5	61.9	-15.20
Scholar	37.1	10.7	63.0	61.3	-17.60
Ernest	36.2	10.5	63.0	59.8	-23.60
Parshall	40.4	10.6	63.7	59.5	-24.80
Alsen	32.4	10.6	64.8	59.4	-25.20
GM50004	34.4	9.6	62.2	76.2	-34.20
Tioga	36.2	12.1	62.5	51.0	-39.93
ND709-9	33.9	10.2	63.5	54.9	-43.20
McVey	35.4	8.7	62.0	72.6	-44.00
MT9955	31.5	9.4	62.8	71.3	-48.90
GM50002	30.3	7.6	62.7	63.5	-72.30
Bounty	30.4	8.9	61.2	61.4	-78.60
Conan	32.2	10.0	63.0	60.0	-82.80
ID377S*	32.3	10.1	63.5	76.3	*
GM40003*	27.7	8.3	63.7	70.0	*
MTHW9420*	29.3	9.7	63.0	70.0	*
GM40002*	30.8	8.2	63.7	59.6	*
GM40020*	26.5	9.6	63.5	59.6	*
GM40019*	28.6	9.8	63.3	56.7	*
Argent*	36.1	10.6	63.0	55.8	*
MTHW9710*	29.0	11.0	61.3	53.0	*
average	32.6	10.1	62.9	62.6	
p value	<0.001	<0.001	<0.001	<0.001	
CV (S/Mean)	4.5	7.9	0.4	8.4	
CV(SE/Mean)	2.6	4.6	0.2	4.8	
LSD 0.05	2.4	1.3	0.4	8.6	

[1]Wheat prices summarized by Gregg Carlson, NARC, Havre, MT, from 10-year average of daily market values for PNW, supplied by the Montana Wheat and Barley Committee

* No average price for hard white wheat available at this time.

Table 22. Relative yielding abilities of spring wheat varieties as compared to McNeal when grown under dryland conditions in Valley County in cooperation with CES.
Cooperator: Bill Lauckner

Cultivar	1995	1996	1997	1998	2000	Ave	as % of McNeal
ID377S	--	--	--	--	76.3	76.3	116.1
GM50004	--	--	--	--	76.2	76.2	116.0
McVey	--	--	--	--	72.6	72.6	110.5
MT9955	--	--	--	--	71.3	71.3	108.5
GM40003	--	--	--	--	70.0	70.0	106.5
McNeal	44.0	34.4	38.5	55.8	65.7	47.7	100.0
MTHW9420	--	--	30.9	54.2	70.0	51.7	96.9
GM50002	--	--	--	--	63.5	63.5	96.7
Amidon	43.7	33.8	38.7	48.4	64.8	45.9	96.2
GM50010	--	--	--	--	63.1	63.1	96.0
Scholar	--	--	36.8	52.1	61.3	50.1	93.9
Bounty	--	--	--	--	61.4	61.4	93.5
Reeder	--	--	--	49.5	61.9	55.7	91.7
Conan	--	--	--	--	60.0	60.0	91.3
GM40002	--	--	--	--	59.6	59.6	90.7
GM40020	--	--	--	--	59.6	59.6	90.7
Alsen	--	--	--	--	59.4	59.4	90.4
GM40019	--	--	--	--	56.7	56.7	86.3
Parshall	--	--	--	44.7	59.5	52.1	85.8
ND709-9	--	--	--	--	54.9	54.9	83.6
Ernest	37.4	31.0	28.3	39.4	59.8	39.2	82.2
Tioga	36.4	30.7	28.7	47.8	51.0	38.9	81.6
MTHW9710	--	--	--	--	53.0	53.0	80.7
Argent	--	--	--	41.8	55.8	48.8	80.3
Verde	--	--	25.9	39.0	56.6	40.5	75.9

NOTE: Average yields in this summary should not be compared to each other since they are not grown in the same years. Compare yields only to the check variety.

Table 23. Relative test weights of spring wheat varieties as compared to McNeal when grown under dryland conditions in Valley County in cooperation with CES.
Cooperator: Bill Lauckner

Cultivar	1995	1996	1997	1998	2000	Ave	as % of McNeal
Alsen	--	--	--	--	64.8	64.8	103.7
Parshall	--	--	--	64.2	63.7	64.0	102.3
Reeder	--	--	--	64.3	63.5	63.9	102.2
GM40003	--	--	--	--	63.7	63.7	101.9
GM40002	--	--	--	--	63.7	63.7	101.9
Argent	--	--	--	64.2	63.0	63.6	101.8
ID377S	--	--	--	--	63.5	63.5	101.6
GM40020	--	--	--	--	63.5	63.5	101.6
ND709-9	--	--	--	--	63.5	63.5	101.6
Ernest	59.9	62.2	58.3	64.0	63.0	61.5	101.4
GM40019	--	--	--	--	63.3	63.3	101.3
Scholar	--	--	59.0	63.3	63.0	61.8	101.1
Amidon	60.8	61.3	58.3	63.0	62.7	61.2	101.0
MTHW9420	--	--	58.5	63.5	63.0	61.7	101.0
Conan	--	--	--	--	63.0	63.0	100.8
Verde	--	--	58.7	62.5	63.0	61.4	100.5
MT9955	--	--	--	--	62.8	62.8	100.5
GM50002	--	--	--	--	62.7	62.7	100.3
Tioga	59.0	61.8	58.2	62.5	62.5	60.8	100.3
McNeal	59.6	60.3	58.2	62.5	62.5	60.6	100.0
GM50004	--	--	--	--	62.2	62.2	99.5
McVey	--	--	--	--	62.0	62.0	99.2
GM50010	--	--	--	--	61.3	61.3	98.1
MTHW9710	--	--	--	--	61.3	61.3	98.1
Bounty	--	--	--	--	61.2	61.2	97.9

NOTE: Average test weights in this summary should not be compared to each other since they are not grown in the same years. Compare test weights only to the check variety.

Table 24. Relative protein contents of spring wheat varieties as compared to McNeal when grown under dryland conditions in Valley County in cooperation with CES.
Cooperator: Bill Lauckner

Cultivar	1995	1996	1997	1998	2000	Ave	as % of McNeal
Parshall	--	--	--	15.4	10.6	13.0	112.6
Verde	--	--	14.9	15.8	12.9	14.5	110.4
Argent	--	--	--	14.6	10.6	12.6	109.1
Reeder	--	--	--	13.5	11.3	12.4	107.4
MTHW9710	--	--	--	--	11.0	11.0	104.8
Scholar	--	--	16.4	13.8	10.7	13.6	103.5
Ernest	14.8	14.3	15.5	15.7	10.5	14.2	103.2
GM50010	--	--	--	--	10.8	10.8	102.9
Tioga	15.6	13.3	16.0	12.9	12.1	14.0	101.9
Alsen	--	--	--	--	10.6	10.6	101.0
MTHW9420	--	--	15.5	14.6	9.7	13.3	100.8
McNeal	14.8	14.3	16.4	12.6	10.5	13.7	100.0
Amidon	14.2	13.8	14.6	14.7	10.1	13.5	98.3
ND709-9	--	--	--	--	10.2	10.2	97.1
ID377S	--	--	--	--	10.1	10.1	96.2
Conan	--	--	--	--	10.0	10.0	95.2
GM40019	--	--	--	--	9.8	9.8	93.3
GM50004	--	--	--	--	9.6	9.6	91.4
GM40020	--	--	--	--	9.6	9.6	91.4
MT9955	--	--	--	--	9.4	9.4	89.5
Bounty	--	--	--	--	8.9	8.9	84.8
McVey	--	--	--	--	8.7	8.7	82.9
GM40003	--	--	--	--	8.3	8.3	79.0
GM40002	--	--	--	--	8.2	8.2	78.1
GM50002	--	--	--	--	7.6	7.6	72.4

NOTE: Average protein contents in this summary should not be compared to each other since they are not grown in the same years. Compare protein contents only to the check variety.

Table 25. Summary of spring wheat yields in bu/acre at two irrigated off-station sites in eastern Montana, 2000. All sites are under pivot irrigation.

Variety	Poplar	Dagmar	average
McVey	64.8	**60.2**	62.5
Reeder	**67.2**	54.0	60.6
GM 40003*	59.3	58.8	59.1
ND709-9	65.0	52.1	58.6
Parshall	64.2	51.4	57.8
GM 40002*	59.2	51.2	55.2
Ernest	56.6	51.1	53.9
Alsen	55.6	49.5	52.6
GM 40019*	55.6	48.6	52.1
Verde	55.9	48.1	52.0
GM 50004	55.3	48.4	51.9
GM 40020*	58.3	43.4	50.9
MT9955	53.4	47.3	50.4
Argent*	54.4	46.0	50.2
McNeal	55.7	44.0	49.9
GM 50002	51.0	47.7	49.4
GM 50010	54.6	43.6	49.1
377S*	48.5	45.2	46.9
Amidon	48.7	44.7	46.7
Scholar	39.6	49.4	44.5
MTHW9420*	45.9	40.8	43.4
Bounty	38.1	45.5	41.8
MTHW9710*	33.8	42.7	38.3
Conan	36.9	35.3	36.1
Gunner	--	48.6	
site average	53.2	47.9	
p value	<0.001	<0.001	
CV (S/Mean)	13.5	8.2	
CV(SE/Mean)	7.8	4.7	
$LSD_{0.05}$	11.8	6.4	

*hard white wheat

Table 26. Summary of spring wheat test weights as lb/bu at two irrigated off-station sites in eastern Montana, 2000. All sites are under pivot irrigation.

Variety	Poplar	Dagmar	average
Parshall	62.0	62.8	62.4
ND709-9	61.7	62.7	62.2
Alsen	61.3	62.8	62.1
Reeder	60.7	61.8	61.3
Ernest	61.0	62.5	61.8
Argent*	60.5	62.0	61.3
GM 40003*	60.8	62.0	61.4
McNeal	60.3	60.7	60.5
Amidon	60.0	62.0	61.0
GM 40002*	60.7	60.0	60.4
377S*	59.2	60.3	59.8
Scholar	59.0	62.5	60.8
Verde	58.8	60.2	59.5
MT9955	59.3	61.2	60.3
Conan	58.8	59.3	59.1
McVey	59.0	60.8	59.9
GM 40020*	60.5	60.8	60.7
GM 40019*	57.7	60.2	59.0
GM 50004	58.3	60.2	59.3
GM 50002	56.7	60.0	58.4
MTHW9420*	57.2	58.5	57.9
Bounty	54.2	58.7	56.5
GM 50010	56.0	57.2	56.6
MTHW9710*	55.8	59.3	57.6
Gunner	--	63.0	
site average	59.2	60.8	
p value	<0.001	<0.001	
CV (S/Mean)	1.7	0.7	
CV(SE/Mean)	1.0	0.4	
$LSD_{0.05}$	1.6	0.7	

*hard white wheat

Table 27. Summary of spring wheat heights in inches at two irrigated off-station sites in eastern Montana, 2000. All sites are under pivot irrigation.

Variety	Poplar	Dagmar	average
Parshall	39.5	44.0	41.8
Amidon	38.2	44.5	41.4
Ernest	37.3	42.0	39.7
Scholar	36.9	40.3	38.6
McVey	36.7	38.1	37.4
McNeal	38.3	35.9	37.1
Argent*	36.6	37.5	37.1
ND709-9	36.9	36.6	36.8
Reeder	37.1	36.2	36.7
MT9955	36.1	36.7	36.4
377S*	35.7	37.0	36.4
GM 50004	36.2	34.8	35.5
Bounty	35.8	35.0	35.4
Verde	34.5	36.1	35.3
Alsen	34.9	34.1	34.5
MTHW9420*	33.3	35.4	34.4
Conan	34.0	33.6	33.8
GM 40002*	32.7	33.5	33.1
GM 50002	32.2	33.5	32.9
GM 40003*	32.1	33.0	32.6
MTHW9710*	31.5	33.2	32.4
GM 40020*	30.8	30.1	30.5
GM 40019*	29.9	29.2	29.6
GM 50010	27.3	25.3	26.3
site average	34.8	35.6	
p value	<0.001	<0.001	
CV (S/Mean)	4.0	6.1	
CV(SE/Mean)	2.3	3.5	
$LSD_{0.05}$	2.3	3.6	

*hard white wheat

Table 28. Summary of spring wheat grain protein contents as percent at two irrigated off-station sites in eastern Montana, 2000. All sites are under pivot irrigation.

Variety	Poplar	Dagmar	average
Parshall	16.3	14.4	15.4
Reeder	16.4	14.2	15.3
Argent*	15.6	14.6	15.1
MTHW9710*	15.9	14.0	15.0
Alsen	15.6	14.4	15.0
Conan	14.6	14.2	14.4
Scholar	15.3	12.8	14.1
ND709-9	14.3	13.9	14.1
Ernest	15.2	12.7	14.0
GM 50010	14.9	13.0	14.0
MT9955	14.9	13.0	14.0
Verde	14.5	13.2	13.9
McNeal	14.8	12.5	13.7
GM 40019*	14.2	12.8	13.5
Amidon	14.1	12.5	13.3
MTHW9420*	14.1	12.3	13.2
377S*	14.2	12.2	13.2
GM 50004	14.0	12.1	13.1
McVey	14.1	12.0	13.1
Bounty	14.1	12.1	13.1
GM 40020*	14.0	11.8	12.9
GM 40002*	13.6	10.8	12.2
GM 40003*	13.0	11.3	12.2
GM 50002	13.5	10.5	12.0
Gunner	--	14.9	
site average	14.6	12.8	
p value	<0.001	<0.001	
CV (S/Mean)	3.1	3.1	
CV(SE/Mean)	1.8	1.8	
$LSD_{0.05}$	0.7	0.7	

*hard white wheat

Table 29. Performance of spring wheat grown under irrigated conditions at Poplar, MT.
Planted: 2 May 2000 Harvested: 15 August 2000 Cooperator: Richard Nygaard

Variety	Height, inches	Grain protein	Test weight	Yield, bu/acre	$/acre[1] +/- McNeal
Reeder	37.1	16.4	60.7	67.2	62.47
Parshall	39.5	16.3	62.0	64.2	46.90
ND709-9	36.9	14.3	61.7	65.0	41.30
McVey	36.7	14.1	59.0	64.8	37.05
Ernest	37.3	15.2	61.0	56.6	7.46
Alsen	34.9	15.6	61.3	55.6	2.27
McNeal	38.3	14.8	60.3	55.7	0.00
Verde	34.5	14.5	58.8	55.9	-1.77
GM 50010	27.3	14.9	56.0	54.6	-2.92
MT9955	36.1	14.9	59.3	53.4	-9.15
GM 50004	36.2	14.0	58.3	55.3	-10.35
GM 50002	32.2	13.5	56.7	51.0	-40.99
Amidon	38.2	14.1	60.0	48.7	-43.28
Scholar	36.9	15.3	59.0	39.6	-80.77
Bounty	35.8	14.1	54.2	38.1	-96.18
Conan	34.0	14.6	58.8	36.9	-98.48
GM 40003*	32.1	13.0	60.8	59.3	*
GM 40002*	32.7	13.6	60.7	59.2	*
GM 40020*	30.8	14.0	60.5	58.3	*
GM 40019*	29.9	14.2	57.7	55.6	*
Argent*	36.6	15.6	60.5	54.4	*
377S*	35.7	14.2	59.2	48.5	*
MTHW9420*	33.3	14.1	57.2	45.9	*
MTHW9710*	31.5	15.9	55.8	33.8	*
average	34.8	14.6	59.2	53.2	
p value	<0.001	<0.001	<0.001	<0.001	
CV (S/Mean)	4.0	3.1	1.7	13.5	
CV(SE/Mean)	2.3	1.8	1.0	7.8	
LSD 0.05	2.3	0.7	1.6	11.8	

[1]Wheat prices summarized by Gregg Carlson, NARC, Havre, MT, from 5-year average of daily market values for PNW, supplied by the Montana Wheat and Barley Committee

* No average price for hard white wheat available at this time.
Lots of disease in this nursery

Table 30. Performance of spring wheat grown under irrigated conditions at Dagmar, MT.
Planted: 2 May 2000 Harvested: 21 August 2000 Cooperator: Steve Brekke

Variety	Height, inches	Grain protein	Test weight	Yield, bu/acre	$/acre[1] +/- McNeal
Reeder	36.2	14.2	61.8	54.0	74.16
McVey	38.1	12.0	60.8	60.2	65.07
Parshall	44.0	14.4	62.8	51.4	63.63
ND709-9	36.6	13.9	62.7	52.1	61.98
Gunner	--	14.9	63.0	48.6	54.23
Alsen	34.1	14.4	62.8	49.5	53.96
Ernest	42.0	12.7	62.5	51.1	35.53
Verde	36.1	13.2	60.2	48.1	29.03
Scholar	40.3	12.8	62.5	49.4	27.76
MT9955	36.7	13.0	61.2	47.3	21.00
GM50004	34.8	12.1	60.2	48.4	13.51
GM50010	25.3	13.0	57.2	43.6	3.87
Amidon	44.5	12.5	62.0	44.7	3.15
Bounty	35.0	12.1	58.7	45.5	0.84
McNeal	35.9	12.5	60.7	44.0	0.00
GM50002	33.5	10.5	60.0	47.7	-7.20
Conan	33.6	14.2	59.3	35.3	-20.09
MTHW9420*	35.4	12.3	58.5	40.8	*
MTHW9710*	33.2	14.0	59.3	42.7	*
377S*	37.0	12.2	60.3	45.2	*
Argent*	37.5	14.6	62.0	46.0	*
GM40003*	33.0	11.3	62.0	58.8	*
GM40002*	33.5	10.8	60.0	51.2	*
GM40019*	29.2	12.8	60.2	48.6	*
GM40020*	30.1	11.8	60.8	43.4	*
average	35.6	12.8	60.8	47.9	
p value	<0.001	<0.001	<0.001	<0.001	
CV (S/Mean)	6.1	3.1	0.7	8.2	
CV(SE/Mean)	3.5	1.8	0.4	4.7	
$LSD_{0.05}$	3.6	0.7	0.7	6.4	

[1]Wheat prices summarized by Gregg Carlson, NARC, Havre, MT, from 5-year average of daily market values for PNW supplied by the Montana Wheat and Barley Committee

** No average price for hard white wheat available at this time.

Table 31. Relative yields of spring wheat varieties as compared to McNeal when grown under irrigated conditions in Sheridan County in cooperation with CES.
Cooperator: Steve Brekke

Cultivar	1993	1996	1998	1999	2000	Ave	as % of McNeal
GM 40003	--	--	--	--	58.8	58.8	133.6
ND 709-9	--	--	--	--	52.1	52.1	118.4
Reeder	--	--	78.4	63.6	54.0	65.3	116.5
GM 40002	--	--	--	--	51.2	51.2	116.4
McVey	--	--	--	51.5	60.2	55.9	114.1
Alsen	--	--	--	--	49.5	49.5	112.5
Gunner	--	--	--	--	48.6	48.6	110.5
GM 40019	--	--	--	--	48.6	48.6	110.5
GM 50004	--	--	--	--	48.4	48.4	110.0
GM 50002	--	--	--	--	47.7	47.7	108.4
Parshall	--	--	69.9	59.9	51.4	60.4	107.7
MT9955	--	--	--	--	47.3	47.3	107.5
Verde	--	--	73.3	--	48.1	60.7	106.2
Amidon	91.3	53.3	63.7	53.6	44.7	61.3	103.5
Bounty	--	--	--	--	45.5	45.5	103.4
Argent	--	--	71.4	55.5	46.0	57.6	102.8
Ernest	--	47.4	67.2	56.8	51.1	55.6	102.6
McNeal	79.5	48.6	70.3	53.9	44.0	59.3	100.0
GM 50010	--	--	--	--	43.6	43.6	99.1
GM 40020	--	--	--	--	43.4	43.4	98.6
MTHW9710	--	--	--	--	42.7	42.7	97.0
377S	--	--	--	48.3	45.2	46.8	95.5
Scholar	--	--	66.1	38.3	49.4	51.3	91.4
MTHW9420	--	--	64.0	47.4	40.8	50.7	90.5
Conan	--	--	--	45.3	35.3	40.3	82.3

NOTE: Average yields in this summary should not be compared to each other since they are not grown in the same years. Compare yields only to the check variety.

Table 32. Relative test weights of spring wheat varieties as compared to McNeal when grown under irrigated conditions in Sheridan County in cooperation with CES.
Cooperator: Steve Brekke

Cultivar	1993	1996	1998	1999	2000	Ave	as % of McNeal
Parshall	--	--	63.3	61.2	62.8	62.4	103.9
Gunner	--	--	--	--	63.0	63.0	103.8
Alsen	--	--	--	--	62.8	62.8	103.5
ND 709-9	--	--	--	--	62.7	62.7	103.3
Argent	--	--	62.8	60.0	62.0	61.6	102.6
GM 40003	--	--	--	--	62.0	62.0	102.1
Reeder	--	--	62.0	60.0	61.8	61.3	102.0
Ernest	--	63.2	62.3	58.8	62.5	61.7	101.9
MT9955	--	--	--	--	61.2	61.2	100.8
Amidon	59.5	62.8	60.7	59.0	62.0	60.8	100.6
Scholar	--	--	61.8	56.8	62.5	60.4	100.5
GM 40020	--	--	--	--	60.8	60.8	100.2
McNeal	60.1	62.0	61.5	58.0	60.7	60.5	100.0
McVey	--	--	--	57.3	60.8	59.1	99.5
GM 40019	--	--	--	--	60.2	60.2	99.2
GM 50004	--	--	--	--	60.2	60.2	99.2
Conan	--	--	--	58.3	59.3	58.8	99.1
Verde	--	--	60.8	--	60.2	60.5	99.0
GM 50002	--	--	--	--	60.0	60.0	98.8
GM 40002	--	--	--	--	60.0	60.0	98.8
377S	--	--	--	56.3	60.3	58.3	98.2
MTHW9710	--	--	--	--	59.3	59.3	97.7
Bounty	--	--	--	--	58.7	58.7	96.7
MTHW9420	--	--	59.2	53.7	58.5	57.1	95.1
GM 50010	--	--	--	--	57.2	57.2	94.2

NOTE: Average test weights in this summary should not be compared to each other since they are not grown in the same years. Compare test weights only to the check variety.

Table 33. Relative protein contents of spring wheat varieties as compared to McNeal when grown under irrigated conditions in Sheridan County in cooperation with CES.
Cooperator: Steve Brekke

Cultivar	1993	1996	1998	1999	2000	Ave	as % of McNeal
Gunner	--	--	--	--	14.9	14.9	119.2
Argent	--	--	15.6	16.0	14.6	15.4	115.8
Alsen	--	--	--	--	14.4	14.4	115.2
Reeder	--	--	15.6	16.1	14.2	15.3	115.0
Parshall	--	--	14.7	16.5	14.4	15.2	114.3
MTHW9710	--	--	--	--	14.0	14.0	112.0
ND 709-9	--	--	--	--	13.9	13.9	111.2
Conan	--	--	--	14.3	14.2	14.3	107.1
Ernest	--	10.9	15.2	15.7	12.7	13.6	107.1
Scholar	--	--	15.0	14.6	12.8	14.1	106.3
Verde	--	--	13.7	--	13.2	13.5	104.3
GM 50010	--	--	--	--	13.0	13.0	104.0
MT9955	--	--	--	--	13.0	13.0	104.0
GM 40019	--	--	--	--	12.8	12.8	102.4
Amidon	15.0	10.8	14.1	14.8	12.5	13.4	102.3
McNeal	14.8	11.0	13.3	14.1	12.5	13.1	100.0
377S	--	--	--	13.9	12.2	13.1	98.1
McVey	--	--	--	13.9	12.0	13.0	97.4
MTHW9420	--	--	13.0	13.5	12.3	12.9	97.2
GM 50004	--	--	--	--	12.1	12.1	96.8
Bounty	--	--	--	--	12.1	12.1	96.8
GM 40020	--	--	--	--	11.8	11.8	94.4
GM 40003	--	--	--	--	11.3	11.3	90.4
GM 40002	--	--	--	--	10.8	10.8	86.4
GM 50002	--	--	--	--	10.5	10.5	84.0

NOTE: Average protein contents in this summary should not be compared to each other since they are not grown in the same years. Compare protein contents only to the check variety.