

PROJECT TITLE: Off-station spring wheat yield trials - 2004

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

COOPERATORS:

County	Producers	CES Agents
Daniels, dryland	Bobbie Roos	Bobbie Roos
McCone, dryland	Victor Wagner	Ken Nelson
Roosevelt, dryland	Mark Swank	Gina Snyder
Sheridan, dryland	Max Aasheim	Terry Angvick
Valley, dryland	Bill Lauckner	Verlin Koenig
Valley, irrigated	Alisha (Zeller) & Cole Sibley	Verlin Koenig
Wibaux, dryland	David Maus	Dave Bertelsen

MATERIALS AND METHODS: Twenty 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	May 5	Sep 7
Circle, McCone County – dryland	Apr 26	Aug 17
Poplar, Roosevelt County – dryland	May 6	Aug 30
Reserve, Sheridan County – dryland	May 6	Sep 7
Wibaux, Wibaux County – dryland	Apr 27	Aug 25
Nashua, Valley County – dryland	Apr 16	Aug 20
Nashua, Valley County – flood irrigated	Apr 16	Aug 26

RESULTS: Summaries of yields, test weights, heights and protein contents across all sites are shown in Tables 1-4. Experimental lines MT0245 and MT 0246 yielded most across dryland sites (Table 1). Hank yielded most at the irrigated site (Table 1).

McCone County: Performance and relative values of spring wheat varieties at **Circle** are shown in Tables 5-8. Scholar and MT0245 had the greatest economic return.

Wibaux County (dryland): Performance and relative values of spring wheat varieties at **Wibaux** are shown in Tables 9-12. Freyr had the greatest economic return.

Roosevelt County (dryland): Performance and relative values of spring wheat varieties at **Poplar** are shown in Tables 13-16. Norpro and Freyr had the greatest economic return.

Sheridan County (dryland): Performance and relative values of spring wheat varieties at **Reserve** are shown in Tables 17-20. MT0245 had the greatest economic return.

Valley County (dryland): Performances of spring wheat varieties at **Nashua** are shown in Table 21-24. MT0266 and MT0245 had the greatest economic return.

Daniels County (dryland): Performance and relative values of spring wheat varieties at **Scobey** are shown in Tables 25-28. McNeal had the greatest economic return.

Valley County (irrigated): Performance and relative values of spring wheat varieties at **Nashua** are shown in Table 29-32. Hank had 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 of experimental lines and varieties from Montana State University, other state universities, and private companies. Regional spring wheat producers make decisions on 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 seven off-station sites in eastern Montana, 2004.

Variety	Circle, dryland recrop	Wibaux, dryland fallow	Poplar, dryland fallow	Reserve , dryland recrop	Nashua, dryland fallow	Scobey, dryland fallow	dryland average	Nashua, flood irrigated
MT0245	34.2	31.7	48.3	56.4	63.2	41.7	45.9	59.6
MT0266	31.9	26.2	49.7	52.6	64.1	45.2	44.9	55.6
Outlook	33.0	28.5	47.2	53.5	61.7	42.3	44.4	58.6
Freyr	28.4	33.0	50.6	50.8	58.5	40.1	43.6	54.1
Reeder	32.4	32.2	45.0	52.7	59.2	35.9	42.9	61.4
McNeal	31.1	28.9	44.2	47.4	54.3	47.4	42.2	54.6
MT0249	30.3	24.8	47.2	46.7	57.7	44.4	41.9	56.9
Norpro	29.0	26.8	50.8	50.7	55.9	37.1	41.7	46.3
Scholar	33.6	26.6	42.6	49.6	52.9	43.8	41.5	51.0
Hank	30.3	30.8	45.5	45.1	53.6	42.9	41.4	66.9
Amidon	30.0	23.3	45.0	51.1	49.9	46.9	41.0	54.4
Hanna	24.5	27.0	48.2	48.1	46.4	40.9	39.2	54.6
NDSW0246	28.4	22.0	49.5	43.2	48.2	43.3	39.1	59.4
ND751	26.4	27.0	48.9	46.6	48.5	36.4	39.0	51.4
McKenzie	23.1	29.9	46.0	43.8	49.6	35.7	38.0	41.7
Choteau	28.7	25.8	38.7	44.5	48.1	39.6	37.6	48.4
Granite	24.0	29.1	46.9	40.8	49.2	34.2	37.4	48.8
Ember	25.4	24.2	47.1	44.9	42.8	39.7	37.3	52.6
Dapps	22.6	29.4	45.1	42.6	45.9	31.8	36.2	54.1
Steele ND	27.7	21.2	40.1	45.8	51.2	29.5	35.9	54.6
site average	28.8	27.4	46.3	47.8	53.0	39.9		54.3
p value	0.002	0.002	0.889	<0.001	<0.001	<0.001		0.008
CV (S/Mean)	12.2	12.0	15.5	6.0	8.0	11.4		11.4
CV(SE/Mean)	7.0	6.9	9.0	3.5	4.6	6.6		6.6
LSD 0.05	5.8	5.4	ns	4.8	7.0	7.5		10.2

Cooperators:

<u>County</u>	<u>Producer</u>	<u>CES Agent</u>
Sheridan (Reserve)	Max Aasheim	Terry Angvick
Wibaux (Wibaux)	David Maus	Dave Bertelsen
McCone (Circle)	Victor Wagner	Ken Nelson
Roosevelt (Poplar)	Mark Swank	Gina Snyder
Valley (Nashua)	Bill Lauckner	Verlin Koenig
Daniels (Scobey)	Bobbie Roos	Bobbie Roos
Valley Irrigated (Nashua)	Alisha (Zeller) & Cole Sibley	Verlin Koenig

Table 2. Summary of spring wheat test weights in lb/bu at seven off-station sites in eastern Montana, 2004.

Variety	Circle, dryland recrop	Wibaux, dryland fallow	Poplar, dryland fallow	Reserve , dryland recrop	Nashua, dryland fallow	Scobey, dryland fallow	dryland average	Nashua, flood irrigated
Granite	61.5	61.7	64.5	63.0	63.0	61.7	62.6	63.5
Ember	62.7	60.3	63.7	61.7	61.7	63.3	62.2	62.3
ND751	62.6	60.0	64.0	62.7	62.8	61.2	62.2	63.0
Freyr	62.0	60.5	63.2	61.8	62.5	61.8	62.0	61.0
Reeder	61.8	59.7	62.7	62.2	62.2	62.3	61.8	60.8
Hanna	61.3	60.2	62.2	61.8	62.0	62.5	61.7	61.5
Scholar	61.0	59.9	62.0	62.2	61.7	63.0	61.6	61.5
Steele ND	61.3	59.2	61.8	61.5	61.0	63.3	61.4	62.0
Norpro	61.8	59.3	63.2	60.5	61.3	61.5	61.3	61.2
NDSW0246	61.0	58.7	63.0	61.0	61.2	61.7	61.1	61.8
Choteau	60.8	59.4	62.3	60.0	61.3	61.7	60.9	60.7
McKenzie	60.7	58.7	62.2	60.5	60.0	63.0	60.9	60.7
MT0245	61.3	58.5	62.2	60.8	60.3	61.7	60.8	59.8
MT0249	60.8	58.3	61.7	60.2	60.3	63.2	60.8	61.0
Dapps	60.6	58.8	62.5	60.2	60.2	61.0	60.5	60.2
Amidon	59.7	59.2	61.5	60.8	60.7	60.2	60.3	60.8
McNeal	59.0	58.5	61.2	60.8	61.0	61.5	60.3	61.0
Outlook	59.8	58.7	61.0	60.7	59.7	60.5	60.1	60.0
Hank	60.2	57.5	60.0	58.0	60.5	62.2	59.7	59.8
MT0266	58.5	56.5	59.8	57.5	58.3	61.8	58.7	58.0
site average	60.9	59.2	62.2	60.9	61.1	62		61.0
p value	<0.001	<0.001	<0.001	<0.001	<0.001	0.087		<0.001
CV (S/Mean)	1.1	0.9	1.4	0.7	1.5	2		1.2
CV(SE/Mean)	0.6	0.5	0.8	0.4	0.8	1.1		0.7
LSD 0.05	1.1	0.9	1.5	0.7	1.5	2		1.2

Cooperators:

<u>County</u>	<u>Producer</u>	<u>CES Agent</u>
Sheridan (Reserve)	Max Aasheim	Terry Angvick
Wibaux (Wibaux)	David Maus	Dave Bertelsen
McCone (Circle)	Victor Wagner	Ken Nelson
Roosevelt (Poplar)	Mark Swank	Gina Snyder
Valley (Nashua)	Bill Lauckner	Verlin Koenig
Daniels (Scobey)	Bobbie Roos	Bobbie Roos
Valley Irrigated (Nashua)	Alisha (Zeller) & Cole Sibley	Verlin Koenig

Table 3. Summary of spring wheat heights in inches at six dryland off-station sites in eastern Montana, 2004.

Variety	Circle, dryland recrop	Wibaux, dryland fallow	Poplar, dryland fallow	Reserve , dryland recrop	Nashua, dryland fallow	Scobey, dryland fallow	dryland average	Nashua, flood irrigated
Scholar	31	23	36	33.6	38	61	37.2	44
Amidon	32	23	38	36.6	39	33	33.6	46
NDSW0246	31	28	37	33.8	39	32	33.5	46
Hanna	30	27	39	35.6	38	31	33.5	42
McKenzie	27	28	39	35.8	37	30	32.7	42
Dapps	28	28	37	35.0	39	26	32.2	44
ND751	27	27	35	32.8	37	26	30.7	38
Freyr	29	28	33	32.0	35	28	30.7	36
Steele ND	30	22	32	32.0	35	30	30.2	39
Reeder	27	27	32	30.2	34	29	29.9	38
Outlook	29	24	32	30.7	33	28	29.3	36
McNeal	29	22	33	30.0	33	28	29.1	36
MT0245	27	23	32	29.5	34	29	29.0	37
Ember	28	20	34	31.1	33	28	29.0	38
MT0266	28	20	31	29.2	32	27	27.9	38
Granite	24	23	32	28.5	31	26	27.5	35
MT0249	26	22	28	27.6	32	26	27.0	34
Norpro	24	22	30	28.2	30	26	26.6	34
Choteau	26	22	30	28.1	28	24	26.3	35
Hank	26	22	28	26.5	31	24	26.2	34
site average	27.9	24.1	33.3	31.4	34.3	28.3		38.6
p value	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		<0.001
CV (S/Mean)	5.7	10.6	4.5	4.9	6.5	6.8		5.1
CV(SE/Mean)	3.3	6.1	2.6	2.8	3.8	3.9		2.9
LSD 0.05	2.6	4.2	2.5	2.5	3.7	3.2		3.23

Cooperators:

<u>County</u>	<u>Producer</u>	<u>CES Agent</u>
Sheridan (Reserve)	Max Aasheim	Terry Angvick
Wibaux (Wibaux)	David Maus	Dave Bertelsen
McCone (Circle)	Victor Wagner	Ken Nelson
Roosevelt (Poplar)	Mark Swank	Gina Snyder
Valley (Nashua)	Bill Lauckner	Verlin Koenig
Daniels (Scobey)	Bobbie Roos	Bobbie Roos
Valley Irrigated (Nashua)	Alisha (Zeller) & Cole Sibley	Verlin Koenig

Table 4. Summary of spring wheat protein contents in percent at seven off-station sites in eastern Montana, 2004.

Variety	Circle, dryland recrop	Wibaux, dryland fallow	Poplar, dryland fallow	Reserve , dryland recrop	Nashua, dryland fallow	Scobey, dryland fallow	dryland average	Nashua, flood irrigated
Dapps	15.9	19.32	11.71	14.79	15.45	13.34	15.09	12.62
Granite	15.5	19.49	11.64	14.86	15.05	12.93	14.91	11.33
MT0266	14.77	18.63	11.91	14.71	14.77	12.23	14.50	11.72
Reeder	14.14	19.13	11.98	13.72	13.39	13.35	14.29	11.83
MT0245	13.83	19.11	11.48	14.20	15.56	11.47	14.28	12.00
NDSW0246	14.76	19.02	11.44	13.99	14.44	11.6	14.21	11.28
MT0249	14.23	19.24	11.90	14.15	14.90	10.32	14.12	10.89
Steele ND	14.85	18.42	10.78	13.33	13.63	11.71	13.79	10.45
Amidon	14.31	18.34	11.54	13.59	12.96	11.94	13.78	10.22
McKenzie	13.93	18.20	11.81	13.30	14.00	11.11	13.73	10.85
Choteau	14.2	18.45	11.22	13.51	13.15	11.15	13.61	10.92
Freyr	13.59	18.49	10.77	13.45	13.17	12.17	13.61	11.42
Scholar	14.52	19.25	11.01	13.67	12.49	10.49	13.57	10.46
ND751	14.05	18.70	9.79	13.86	13.25	10.59	13.37	11.49
Hank	12.7	18.38	10.98	14.23	12.68	10.58	13.26	10.85
Norpro	14.65	18.43	9.13	13.98	12.22	10.79	13.20	10.28
Outlook	12.89	17.43	10.42	12.63	12.78	11.96	13.02	10.48
Hanna	13.87	17.69	9.69	13.02	12.38	11.08	12.96	10.55
McNeal	13.04	17.99	11.05	12.71	11.62	11.23	12.94	10.10
Ember	13.32	18.10	9.31	13.08	13.04	10.03	12.81	9.06
site average	14.15	18.59	10.98	13.74	13.55	11.50		10.94
p value	0.001	<0.001	0.190	<0.001	0.003	0.011		<0.001
CV (S/Mean)	5.6	2.5	11.9	3.2	8.7	9.4		6.5

Cooperators:

County

Sheridan (Reserve)

Wibaux (Wibaux)

McCone (Circle)

Roosevelt (Poplar)

Valley (Nashua)

Daniels (Scobey)

Valley Irrigated (Nashua)

Producer

Max Aasheim

David Maus

Victor Wagner

Mark Swank

Bill Lauckner

Bobbie Roos

Alisha (Zeller) & Cole Sibley

CES Agent

Terry Angvick

Dave Bertelsen

Ken Nelson

Gina Snyder

Verlin Koenig

Bobbie Roos

Verlin Koenig

Table 5. Performance of spring wheat grown under dryland continuous cropping conditions at Circle, MT. Planted: Apr 26, 2004 Harvested: Aug 17, 2004 Cooperator: Victor Wagner

Variety	Height, inches	Grain protein	Test weight	Yield, bu/acre	\$/acre ¹ +/- McNeal
Scholar	30.7	14.52	61.0	33.6	23.24
MT0245	27.3	13.83	61.3	34.2	21.00
MT0266	27.7	14.77	58.5	31.9	16.32
Reeder	27.3	14.14	61.8	32.4	16.16
Outlook	28.7	12.89	59.8	33.0	8.47
MT0249	25.7	14.23	60.8	30.3	6.12
Amidon	32.0	14.31	59.7	30.0	4.69
Norpro	24.3	14.65	61.8	29.0	1.07
McNeal	29.0	13.04	59.0	31.1	0.00
NDSW0246	31.0	14.76	61.0	28.4	-0.69
Choteau	26.0	14.20	60.8	28.7	-1.52
Steele ND	29.7	14.85	61.3	27.7	-4.09
Hank	25.7	12.70	60.2	30.3	-5.06
Freyr	28.7	13.59	62.0	28.4	-8.07
ND751	27.0	14.05	62.6	26.4	-13.31
Granite	24.0	15.50	61.5	24.0	-21.11
Ember	27.7	13.32	62.7	25.4	-23.65
Hanna	30.0	13.87	61.3	24.5	-24.29
Dapps	28.0	15.90	60.6	22.6	-27.97
McKenzie	27.3	13.93	60.7	23.1	-28.98
average	27.9	14.15	60.9	28.8	
p value	<0.001	0.001	<0.001	0.002	
CV (S/Mean)	5.7	5.6	1.1	12.2	
CV(SE/Mean)	3.3	3.2	0.6	7.0	
LSD 0.05	2.6	1.31	1.1	5.8	

¹ Wheat prices summarized by G. Carlson, NARC, Havre, MT, from 10-year (1994-2003) average daily market values for PNW, supplied by the Montana Wheat and Barley Committee

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	2000	2001	2002	2003	2004	Ave	as % of McNeal
Outlook	--	40.5	13.9	26.6	33.0	28.5	113.8
Reeder	27.0	38.5	16.4	26.1	32.4	28.1	111.9
Scholar	28.4	33.0	17.9	25.5	33.6	27.7	110.3
MT0245	--	--	--	--	34.2	34.2	110.0
Amidon	26.7	35.1	13.6	23.9	30.0	25.9	103.0
MT0266	--	--	--	--	31.9	31.9	102.6
McNeal	25.3	33.0	13.2	22.9	31.1	25.1	100.0
MT0249	--	--	--	--	30.3	30.3	97.4
Hank	--	--	12.2	21.2	30.3	21.2	94.8
Norpro	--	--	--	--	29.0	29.0	93.2
NDSW0246	--	--	--	--	28.4	28.4	91.3
Freyr	--	--	--	--	28.4	28.4	91.3
Steele ND	--	--	--	--	27.7	27.7	89.1
McKenzie	--	--	14.8	21.2	23.1	19.7	87.9
Ember	--	--	12.9	20.1	25.4	19.5	86.9
Choteau	--	25.2	9.1	23.5	28.7	21.6	86.3
ND751	--	--	--	--	26.4	26.4	84.9
Hanna	--	--	--	--	24.5	24.5	78.8
Granite	--	--	--	--	24.0	24.0	77.2
Dapps	--	--	--	--	22.6	22.6	72.7

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	2000	2001	2002	2003	2004	Ave	as % of McNeal
Ember	--	--	62.1	62.0	62.7	62.3	106.7
ND751	--	--	--	--	62.6	62.6	106.1
Freyr	--	--	--	--	62.0	62.0	105.1
Norpro	--	--	--	--	61.8	61.8	104.7
Scholar	62.7	63.0	61.4	61.2	61.0	61.9	104.3
Granite	--	--	--	--	61.5	61.5	104.2
MT0245	--	--	--	--	61.3	61.3	103.9
Steele ND	--	--	--	--	61.3	61.3	103.9
Hanna	--	--	--	--	61.3	61.3	103.9
Reeder	62.3	63.2	59.8	60.3	61.8	61.5	103.7
NDSW0246	--	--	--	--	61.0	61.0	103.4
MT0249	--	--	--	--	60.8	60.8	103.1
Dapps	--	--	--	--	60.6	60.6	102.7
Choteau	--	62.8	59.7	59.6	60.8	60.7	102.7
McKenzie	--	--	59.2	59.7	60.7	59.9	102.6
Amidon	61.5	62.8	60.3	59.7	59.7	60.8	102.5
Outlook	--	61.0	58.3	57.7	59.8	59.2	100.1
McNeal	60.0	61.5	58.7	57.3	59.0	59.3	100.0
Hank	--	--	56.7	57.1	60.2	58.0	99.4
MT0266	--	--	--	--	58.5	58.5	99.2

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 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	2000	2001	2002	2003	2004	Ave	as % of McNeal
Dapps	--	--	--	--	15.9	15.9	122.3
Granite	--	--	--	--	15.5	15.5	119.2
MT0266	--	--	--	--	14.8	14.8	113.8
NDSW0246	--	--	--	--	14.8	14.8	113.8
Steele ND	--	--	--	--	14.8	14.8	113.8
Norpro	--	--	--	--	14.6	14.6	112.3
Reeder	11.2	10.8	12.7	15.7	14.1	12.9	111.8
MT0249	--	--	--	--	14.2	14.2	109.2
Choteau	--	10.1	12.2	15.1	14.2	12.9	107.7
ND751	--	--	--	--	14.0	14.0	107.7
Hanna	--	--	--	--	13.9	13.9	106.9
Scholar	9.4	9.9	11.8	15.9	14.5	12.3	106.6
MT0245	--	--	--	--	13.8	13.8	106.2
Amidon	10.1	10.3	11.2	15.1	14.3	12.2	105.7
McKenzie	--	--	11.9	15.3	13.9	13.7	105.1
Freyr	--	--	--	--	13.6	13.6	104.6
Outlook	--	10.1	11.5	14.9	12.9	12.4	103.1
Ember	--	--	11.5	15.3	13.3	13.4	102.6
McNeal	9.8	8.8	11.2	14.9	13.0	11.5	100.0
Hank	--	--	12.0	14.2	12.7	13.0	99.5

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: Apr 27, 2004 Harvested: Aug 25, 2004 Cooperator: David Maus

Variety	Height, inches	Grain protein	Test weight	Yield, bu/acre	\$/acre ¹ +/- McNeal
Freyr	28.3	18.49	60.5	33.0	20.09
Reeder	26.7	19.13	59.7	32.2	16.17
MT0245	22.7	19.11	58.5	31.7	13.72
Hank	21.7	18.38	57.5	30.8	9.31
McKenzie	27.7	18.20	58.7	29.9	4.90
Dapps	28.3	19.32	58.8	29.4	2.45
Granite	22.7	19.49	61.7	29.1	0.98
McNeal	22.3	17.99	58.5	28.9	0.00
Outlook	23.7	17.43	58.7	28.5	-1.96
ND751	27.0	18.70	60.0	27.0	-9.31
Hanna	27.3	17.69	60.2	27.0	-9.31
Norpro	22.0	18.43	59.3	26.8	-10.29
Scholar	23.3	19.25	59.9	26.6	-11.27
MT0266	20.3	18.63	56.5	26.2	-13.23
Choteau	22.3	18.45	59.4	25.8	-15.19
MT0249	22.0	19.24	58.3	24.8	-20.09
Ember	20.3	18.10	60.3	24.2	-23.03
Amidon	22.7	18.34	59.2	23.3	-27.44
NDSW0246	28.3	19.02	58.7	22.0	-33.81
Steele ND	22.0	18.42	59.2	21.2	-37.73
average	24.1	18.59	59.2	27.4	
p value	<0.001	<0.001	<0.001	0.002	
CV (S/Mean)	10.6	2.5	0.9	12.0	
CV(SE/Mean)	6.1	1.4	0.5	6.9	
LSD 0.05	4.2	0.76	0.9	5.4	

¹ Wheat prices summarized by G. Carlson, NARC, Havre, MT, from 10-year (1994-2003) average daily market values for PNW, supplied by the Montana Wheat and Barley Committee

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	2000	2001	2002	2003	2004	Ave	as % of McNeal
Freyr	--	--	--	--	33.0	33.0	114.2
MT0245	--	--	--	--	31.7	31.7	109.7
Hank	--	--	31.4	19.2	30.8	27.1	109.6
Reeder	45.1	49.4	30.8	20.6	32.2	35.6	106.1
Outlook	--	50.2	27.0	23.3	28.5	32.3	105.1
Dapps	--	--	--	--	29.4	29.4	101.7
Granite	--	--	--	--	29.1	29.1	100.7
McNeal	45.2	48.4	25.4	20.0	28.9	33.6	100.0
Amidon	46.7	45.2	26.7	15.2	33.3	33.4	99.5
McKenzie	--	--	29.8	13.8	29.9	24.5	98.9
Scholar	46.9	42.0	32.3	15.2	26.6	32.6	97.1
Ember	--	--	28.8	17.2	24.2	23.4	94.5
ND751	--	--	--	--	27.0	27.0	93.4
Hanna	--	--	--	--	27.0	27.0	93.4
Norpro	--	--	--	--	26.8	26.8	92.7
MT0266	--	--	--	--	26.2	26.2	90.7
MT0249	--	--	--	--	24.8	24.8	85.8
Choteau	--	38.3	25.0	14.7	25.8	26.0	84.6
NDSW0246	--	--	--	--	22.0	22.0	76.1
Steele ND	--	--	--	--	21.2	21.2	73.4

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	2000	2001	2002	2003	2004	Ave	as % of McNeal
Ember	--	--	59.6	58.8	60.3	59.6	105.9
Granite	--	--	--	--	61.7	61.7	105.5
Scholar	62.3	61.7	60.2	58.1	59.9	60.4	104.0
Freyr	--	--	--	--	60.5	60.5	103.4
Hanna	--	--	--	--	60.2	60.2	102.9
ND751	--	--	--	--	60.0	60.0	102.6
McKenzie	--	--	57.3	56.7	58.7	57.6	102.4
Reeder	63.3	60.7	57.5	56.3	59.7	59.5	102.3
Choteau	--	60.5	57.6	55.6	59.4	58.3	101.9
Amidon	62.0	61.2	57.8	55.6	59.2	59.2	101.8
Norpro	--	--	--	--	59.3	59.3	101.4
Steele ND	--	--	--	--	59.2	59.2	101.2
Dapps	--	--	--	--	58.8	58.8	100.5
NDSW0246	--	--	--	--	58.7	58.7	100.3
Outlook	--	59.2	57.0	54.3	58.7	57.3	100.2
McNeal	62.0	60.0	57.5	52.7	58.5	58.1	100.0
MT0245	--	--	--	--	58.5	58.5	100.0
MT0249	--	--	--	--	58.3	58.3	99.7
Hank	--	--	57.0	52.0	57.5	55.5	98.7
MT0266	--	--	--	--	56.5	56.5	96.6

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 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	2000	2001	2002	2003	2004	Ave	as % of McNeal
Granite	--	--	--	--	19.5	19.5	108.3
Dapps	--	--	--	--	19.3	19.3	107.2
Reeder	18.1	16.3	17.1	19.0	19.1	17.9	106.9
MT0249	--	--	--	--	19.2	19.2	106.7
MT0245	--	--	--	--	19.1	19.1	106.1
NDSW0246	--	--	--	--	19.0	19.0	105.6
ND751	--	--	--	--	18.7	18.7	103.9
MT0266	--	--	--	--	18.6	18.6	103.3
Freyr	--	--	--	--	18.5	18.5	102.8
Scholar	16.6	15.0	16.2	18.7	19.2	17.1	102.3
Norpro	--	--	--	--	18.4	18.4	102.2
Steele ND	--	--	--	--	18.4	18.4	102.2
McNeal	15.8	14.4	16.3	19.3	18.0	16.8	100.0
Amidon	17.0	13.9	15.8	18.7	18.3	16.7	99.9
Hanna	--	--	--	--	17.7	17.7	98.3
McKenzie	--	--	16.0	18.4	18.2	17.5	98.1
Choteau	--	14.8	15.6	17.5	18.4	16.6	97.5
Hank	--	--	15.8	18.0	18.4	17.4	97.4
Ember	--	--	15.9	18.0	18.1	17.3	97.0
Outlook	--	13.6	15.8	18.4	17.4	16.3	95.9

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: May 6, 2004 Harvested: Aug 30, 2004 Cooperator: Mark Swank

Variety	Height, inches	Grain protein	Test weight	Yield, bu/acre	\$/acre ¹ +/- McNeal
Norpro	29.6	9.13	63.2	50.8	27.98
Freyr	32.6	10.77	63.2	50.6	27.13
MT0266	30.6	11.91	59.8	49.7	23.32
NDSW0246	37.1	11.44	63.0	49.5	22.47
ND751	34.6	9.79	64.0	48.9	19.93
MT0245	31.8	11.48	62.2	48.3	17.38
Hanna	39.1	9.69	62.2	48.2	16.96
Outlook	31.8	10.42	61.0	47.2	12.72
MT0249	28.3	11.90	61.7	47.2	12.72
Ember	34.5	9.31	63.7	47.1	12.29
Granite	31.8	11.64	64.5	46.9	11.45
McKensie	38.7	11.81	62.2	46.0	7.63
Hank	27.8	10.98	60.0	45.5	5.51
Dapps	36.9	11.71	62.5	45.1	3.81
Amidon	37.7	11.54	61.5	45.0	3.39
Reeder	32.2	11.98	62.7	45.0	3.39
McNeal	32.7	11.05	61.2	44.2	0.00
Scholar	36.2	11.01	62.0	42.6	-6.79
Steele (ND741)	32.3	10.78	61.8	40.1	-17.39
Choteau	29.5	11.22	62.3	38.7	-23.32
average	33.3	10.98	62.2	46.3	
p value	<0.001	0.190	<0.001	0.889	
CV (S/Mean)	4.5	11.9	1.4	15.5	
CV(SE/Mean)	2.6	6.9	0.8	9.0	
LSD 0.05	2.5	2.15	1.5	11.9	

¹ Wheat prices summarized by G. Carlson, NARC, Havre, MT, from 10-year (1994-2003) average daily market values for PNW, supplied by the Montana Wheat and Barley Committee

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	2000	2001	2002	2003	2004	Ave	as % of McNeal
Norpro	--	--	--	--	50.8	50.8	114.9
Freyr	--	--	--	--	50.6	50.6	114.5
MT0266	--	--	--	--	49.7	49.7	112.4
NDSW0246	--	--	--	--	49.5	49.5	112.0
ND751	--	--	--	--	48.9	48.9	110.6
MT0245	--	--	--	--	48.3	48.3	109.3
Hanna	--	--	--	--	48.2	48.2	109.0
MT0249	--	--	--	--	47.2	47.2	106.8
Reeder	66.4	59.9	46.4	56.8	45.0	54.9	106.6
Granite	--	--	--	--	46.9	46.9	106.1
Outlook	--	64.0	41.7	56.5	47.2	52.4	105.2
Dapps	--	--	--	--	45.1	45.1	102.0
McNeal	58.4	58.5	37.1	59.3	44.2	51.5	100.0
Scholar	58.9	61.6	37.8	53.0	42.6	50.8	98.6
Hank	--	--	38.5	54.3	45.5	46.1	98.4
McKenzie	--	--	40.6	51.7	46.0	46.1	98.4
Amidon	62.4	57.8	34.0	53.7	45.0	50.6	98.2
Ember	--	--	41.1	47.7	47.1	45.3	96.7
Choteau	--	54.5	40.7	53.7	38.7	46.9	94.2
Steele ND	--	--	--	--	40.1	40.1	90.7

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	2000	2001	2002	2003	2004	Ave	as % of McNeal
Ember	--	--	62.0	62.8	63.7	62.8	107.0
Granite	--	--	--	--	64.5	64.5	105.4
McKenzie	--	--	60.5	61.5	62.2	61.4	104.6
ND751	--	--	--	--	64.0	64.0	104.6
Reeder	63.0	63.7	60.5	62.2	62.7	62.4	103.9
Norpro	--	--	--	--	63.2	63.2	103.3
Freyr	--	--	--	--	63.2	63.2	103.3
Scholar	61.8	63.5	60.0	62.8	62.0	62.0	103.2
NDSW0246	--	--	--	--	63.0	63.0	102.9
Choteau	--	63.2	58.5	61.5	62.3	61.4	102.8
Amidon	62.2	63.0	59.2	62.3	61.5	61.6	102.6
Dapps	--	--	--	--	62.5	62.5	102.1
MT0245	--	--	--	--	62.2	62.2	101.6
Hanna	--	--	--	--	62.2	62.2	101.6
Steele ND	--	--	--	--	61.8	61.8	101.0
MT0249	--	--	--	--	61.7	61.7	100.8
Outlook	--	61.8	58.2	59.8	61.0	60.2	100.8
McNeal	61.5	62.8	54.2	60.7	61.2	60.1	100.0
Hank	--	--	57.2	58.5	60.0	58.6	99.8
MT0266	--	--	--	--	59.8	59.8	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 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	2000	2001	2002	2003	2004	Ave	as % of McNeal
Reeder	16.1	15.4	15.6	14.3	12.0	14.7	116.1
MT0266	--	--	--	--	11.9	11.9	108.2
MT0249	--	--	--	--	11.9	11.9	108.2
Scholar	14.2	14.6	14.7	13.1	11.0	13.5	107.0
Dapps	--	--	--	--	11.7	11.7	106.4
Granite	--	--	--	--	11.6	11.6	105.5
McKenzie	--	--	14.7	12.9	11.8	13.1	105.3
MT0245	--	--	--	--	11.5	11.5	104.5
Hank	--	--	14.6	13.3	11.0	13.0	104.0
NDSW0246	--	--	--	--	11.4	11.4	103.6
Amidon	13.5	13.6	13.9	12.8	11.5	13.1	103.3
Choteau	--	12.9	14.5	13.3	11.2	13.0	103.2
McNeal	12.9	12.9	13.9	12.5	11.0	12.6	100.0
Outlook	--	13.4	13.6	12.9	10.4	12.6	100.0
Ember	--	--	14.5	13.0	9.3	12.3	98.4
Freyr	--	--	--	--	10.8	10.8	98.2
Steele ND	--	--	--	--	10.8	10.8	98.2
ND751	--	--	--	--	9.8	9.8	89.1
Hanna	--	--	--	--	9.7	9.7	88.2
Norpro	--	--	--	--	9.1	9.1	82.7

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: May 6, 2004 Harvested: Sep 7, 2004 Cooperator: Max Aasheim

Variety	Height, inches	Grain protein	Test weight	Yield, bu/acre	\$/acre ¹ +/- McNeal
MT0245	29.5	14.20	60.8	56.4	60.56
MT0266	29.2	14.71	57.5	52.6	46.61
Reeder	30.2	13.72	62.2	52.7	37.08
Norpro	28.2	13.98	61.5	50.7	31.79
Outlook	30.7	12.63	60.7	53.5	26.91
Amidon	36.6	13.59	60.8	51.1	26.03
Freyr	32.0	13.45	61.8	50.8	24.65
Scholar	33.6	13.67	62.2	49.6	22.60
MT0249	27.6	14.15	60.2	46.7	14.20
ND751	32.8	13.86	62.7	46.6	8.59
Hank	26.5	14.23	58.0	45.1	6.55
Hanna	35.6	13.02	61.8	48.1	5.50
McNeal	30.0	12.71	60.8	47.4	0.00
Steele ND	32.0	13.33	61.5	45.8	-1.56
Dapps	35.0	14.79	60.2	42.6	-1.99
NDSW0246	33.8	13.99	61.0	43.2	-3.83
Choteau	28.1	13.51	60.0	44.5	-4.33
Ember	31.1	13.08	61.7	44.9	-8.78
McKensie	35.8	13.30	60.5	43.8	-10.62
Granite	28.5	14.86	63.0	40.8	-10.74
average	31.4	13.74	60.9	47.8	
p value	<0.001	<0.001	<0.001	<0.001	
CV (S/Mean)	4.9	3.2	0.7	6.0	
CV(SE/Mean)	2.8	1.8	0.4	3.5	
LSD 0.05	2.5	0.72	0.7	4.8	

¹ Wheat prices summarized by G. Carlson, NARC, Havre, MT, from 10-year (1994-2003) average daily market values for PNW, supplied by the Montana Wheat and Barley Committee

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	2000	2001	2002	2003	2004	Ave	as % of McNeal
MT0245	--	--	--	--	56.4	56.4	119.0
Outlook	--	44.2	39.6	41.9	53.5	44.8	113.4
MT0266	--	--	--	--	52.6	52.6	111.0
Reeder	38.2	45.4	38.3	39.2	52.7	42.8	109.8
Freyr	--	--	--	--	50.8	50.8	107.2
Norpro	--	--	--	--	50.7	50.7	107.0
Hank	--	--	33.4	41.2	45.1	39.9	105.5
Ember	--	--	36.2	38.3	44.9	39.8	105.2
Amidon	39.6	45.6	29.1	38.5	51.1	40.8	104.7
Hanna	--	--	--	--	48.1	48.1	101.5
Choteau	--	41.8	35.4	38.5	44.5	40.1	101.4
McKenzie	--	--	33.4	37.3	43.8	38.2	100.9
McNeal	36.8	44.5	28.2	37.9	47.4	39.0	100.0
Scholar	32.8	42.7	28.2	39.0	49.6	38.5	98.7
MT0249	--	--	--	--	46.7	46.7	98.5
ND751	--	--	--	--	46.6	46.6	98.3
Steele ND	--	--	--	--	45.8	45.8	96.6
NDSW0246	--	--	--	--	43.2	43.2	91.1
Dapps	--	--	--	--	42.6	42.6	89.9
Granite	--	--	--	--	40.8	40.8	86.1

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	2000	2001	2002	2003	2004	Ave	as % of McNeal
Ember	--	--	62.3	61.0	61.7	61.7	104.8
Granite	--	--	--	--	63.0	63.0	103.6
ND751	--	--	--	--	62.7	62.7	103.1
Reeder	61.7	63.7	59.7	60.7	62.2	61.6	102.6
Scholar	61.2	63.5	59.2	60.3	62.2	61.3	102.0
Freyr	--	--	--	--	61.8	61.8	101.6
Hanna	--	--	--	--	61.8	61.8	101.6
Amidon	60.8	63.0	59.2	60.2	60.8	60.8	101.2
Norpro	--	--	--	--	61.5	61.5	101.2
Steele ND	--	--	--	--	61.5	61.5	101.2
McKenzie	--	--	58.3	59.3	60.5	59.4	100.8
Choteau	--	63.2	58.8	59.2	60.0	60.3	100.8
NDSW0246	--	--	--	--	61.0	61.0	100.3
McNeal	61.0	62.7	58.3	57.5	60.8	60.1	100.0
MT0245	--	--	--	--	60.8	60.8	100.0
Outlook	--	61.7	58.5	57.8	60.7	59.7	99.7
MT0249	--	--	--	--	60.2	60.2	99.0
Dapps	--	--	--	--	60.2	60.2	99.0
Hank	--	--	56.8	55.8	58.0	56.9	96.6
MT0266	--	--	--	--	57.5	57.5	94.6

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 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	2000	2001	2002	2003	2004	Ave	as % of McNeal
Granite	--	--	--	--	14.9	14.9	117.3
Dapps	--	--	--	--	14.8	14.8	116.5
MT0266	--	--	--	--	14.7	14.7	115.7
MT0245	--	--	--	--	14.2	14.2	111.8
MT0249	--	--	--	--	14.2	14.2	111.8
Norpro	--	--	--	--	14.0	14.0	110.2
NDSW0246	--	--	--	--	14.0	14.0	110.2
ND751	--	--	--	--	13.9	13.9	109.4
Reeder	13.6	15.8	14.1	17.2	13.7	14.9	108.5
Scholar	11.9	15.6	14.5	17.1	13.7	14.6	106.1
Hank	--	--	14.1	16.9	14.2	15.1	106.1
Freyr	--	--	--	--	13.4	13.4	105.5
Steele ND	--	--	--	--	13.3	13.3	104.7
Amidon	11.9	15.4	13.7	16.5	13.6	14.2	103.6
McKenzie	--	--	14.0	16.8	13.3	14.7	103.5
Hanna	--	--	--	--	13.0	13.0	102.4
Choteau	--	14.4	13.9	16.8	13.5	14.7	102.1
McNeal	11.2	14.8	13.1	16.8	12.7	13.7	100.0
Ember	--	--	12.8	16.7	13.1	14.2	100.0
Outlook	--	14.8	13.2	16.4	12.6	14.3	99.3

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: Apr 16, 2004 Harvested: Aug 20, 2004 Cooperator: Bill Lauckner

Variety	Height, inches	Grain protein	Test weight	Yield, bu/acre	\$/acre ¹ +/- McNeal
MT0266	32	14.77	58.3	64.1	81.30
MT0245	34	15.56	60.3	63.2	79.45
MT0249	32	14.90	60.3	57.7	52.50
Reeder	34	13.39	62.2	59.2	42.09
Outlook	33	12.78	59.7	61.7	41.87
Freyr	35	13.17	62.5	58.5	21.32
Granite	31	15.05	63.0	49.2	10.85
Norpro	30	12.22	61.3	55.9	9.58
Hank	31	12.68	60.5	53.6	6.15
Steele ND	35	13.63	61.0	51.2	5.29
NDSW0246	39	14.44	61.2	48.2	2.09
McKensie	37	14.00	60.0	49.6	0.91
McNeal	33	11.62	61.0	54.3	0.00
Scholar	38	12.49	61.7	52.9	-0.11
Dapps	39	15.45	60.2	45.9	-5.32
Amidon	39	12.96	60.7	49.9	-7.68
ND751	37	13.25	62.8	48.5	-21.68
Choteau	28	13.15	61.3	48.1	-23.40
Hanna	38	12.38	62.0	46.4	-28.39
Ember	33	13.04	61.7	42.8	-39.34
average	34.3	13.55	61.1	53.0	
p value	<0.001	0.003	<0.001	<0.001	
CV (S/Mean)	6.5	8.7	1.5	8.0	
CV(SE/Mean)	3.8	5.0	0.8	4.6	
LSD 0.05	3.7	1.95	1.5	7.0	

¹ Wheat prices summarized by G. Carlson, NARC, Havre, MT, from 10-year (1994-2003) average daily market values for PNW, supplied by the Montana Wheat and Barley Committee

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	2000	2001	2002	2003	2004	Ave	as % of McNeal
MT0266	--	--	--	--	64.1	64.1	118.0
MT0245	--	--	--	--	63.2	63.2	116.4
Freyr	--	--	--	--	58.5	58.5	107.7
MT0249	--	--	--	--	57.7	57.7	106.3
Reeder	61.9	70.0	51.6	39.7	59.2	56.5	105.3
Outlook	--	56.9	48.7	42.7	61.7	52.5	103.7
Hank	--	--	47.7	42.5	53.6	47.9	103.2
Norpro	--	--	--	--	55.9	55.9	102.9
McNeal	65.7	63.3	45.6	39.4	54.3	53.7	100.0
Scholar	61.3	62.2	46.7	37.6	52.9	52.1	97.2
McKenzie	--	--	45.3	39.3	49.6	44.7	96.3
Steele ND	--	--	--	--	51.2	51.2	94.3
Amidon	64.8	56.1	43.0	39.0	49.9	50.6	94.2
Choteau	--	64.1	42.3	33.6	48.1	47.0	92.8
Ember	--	60.1	47.2	36.7	42.8	46.7	92.2
Granite	--	--	--	--	49.2	49.2	90.6
ND751	--	--	--	--	48.5	48.5	89.3
NDSW0246	--	--	--	--	48.2	48.2	88.8
Hanna	--	--	--	--	46.4	46.4	85.5
Dapps	--	--	--	--	45.9	45.9	84.5

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	2000	2001	2002	2003	2004	Ave	as % of McNeal
Granite	--	--	--	--	63.0	63.0	103.3
ND751	--	--	--	--	62.8	62.8	103.0
Ember	--	62.8	61.0	60.0	61.7	61.4	102.5
Freyr	--	--	--	--	62.5	62.5	102.5
Scholar	63.0	63.2	60.5	60.2	61.7	61.7	102.2
Hanna	--	--	--	--	62.0	62.0	101.6
Reeder	63.5	62.7	60.0	58.2	62.2	61.3	101.6
Choteau	--	62.8	59.0	59.0	61.3	60.5	101.1
Amidon	62.7	61.8	59.5	59.7	60.7	60.9	100.8
Norpro	--	--	--	--	61.3	61.3	100.5
McKenzie	--	--	59.0	59.5	60.0	59.5	100.3
NDSW0246	--	--	--	--	61.2	61.2	100.3
McNeal	62.5	61.5	59.7	57.2	61.0	60.4	100.0
Steele ND	--	--	--	--	61.0	61.0	100.0
Outlook	--	61.0	58.8	57.2	59.7	59.2	98.9
MT0245	--	--	--	--	60.3	60.3	98.9
MT0249	--	--	--	--	60.3	60.3	98.9
Dapps	--	--	--	--	60.2	60.2	98.7
Hank	--	--	57.0	55.7	60.5	57.7	97.4
MT0266	--	--	--	--	58.3	58.3	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 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	2000	2001	2002	2003	2004	Ave	as % of McNeal
MT0245	--	--	--	--	15.6	15.6	134.5
Dapps	--	--	--	--	15.4	15.4	132.8
Granite	--	--	--	--	15.0	15.0	129.3
MT0249	--	--	--	--	14.9	14.9	128.4
MT0266	--	--	--	--	14.8	14.8	127.6
NDSW0246	--	--	--	--	14.4	14.4	124.1
Steele ND	--	--	--	--	13.6	13.6	117.2
Reeder	11.3	13.8	14.1	18.0	13.4	14.1	115.5
Freyr	--	--	--	--	13.2	13.2	113.8
ND751	--	--	--	--	13.2	13.2	113.8
McKenzie	--	--	12.9	16.2	14.0	14.4	113.4
Hank	--	--	12.8	16.8	12.7	14.1	111.3
Ember	--	14.0	12.6	16.0	13.0	13.9	109.9
Hanna	--	--	--	--	12.4	12.4	106.9
Scholar	10.7	13.4	12.6	16.1	12.5	13.1	106.9
Norpro	--	--	--	--	12.2	12.2	105.2
Choteau	--	11.9	12.4	15.7	13.2	13.3	105.1
Amidon	10.1	13.0	11.8	15.5	13.0	12.7	103.8
Outlook	--	11.6	12.3	15.5	12.8	13.1	103.2
McNeal	10.5	12.6	11.0	15.4	11.6	12.2	100.0

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.

Table 25. Performance of spring wheat grown under dryland conditions at Scobey, MT.
 Planted: May 5, 2004 Harvested: Sep 7, 2004 Cooperator: Bobbie Roos

Variety	Height, inches	Grain protein	Test Weight	Yield Bu/acre	\$/acre ¹ +/- McNeal
McNeal	28.4	11.23	61.5	47.4	0.00
Amidon	33.4	11.94	60.2	46.9	-2.97
MT0266	27.4	12.23	61.8	45.2	-7.07
MT0249	26.0	10.32	63.2	44.4	-12.72
Scholar	31.3	10.49	63.0	43.8	-15.27
NDSW0246	32.4	11.60	61.7	43.3	-17.39
Hank	24.3	10.58	62.2	42.9	-19.08
Outlook	27.5	11.96	60.5	42.3	-21.63
MT0245	28.9	11.47	61.7	41.7	-24.17
Hanna	31.2	11.08	62.5	40.9	-27.56
Freyr	28.2	12.17	61.8	40.1	-28.95
Ember	27.8	10.03	63.3	39.7	-32.65
Choteau	23.9	11.15	61.7	39.6	-33.08
Reeder	29.4	13.35	62.3	35.9	-38.35
Norpro	26.0	10.79	61.5	37.1	-43.68
ND751	26.4	10.59	61.2	36.4	-46.64
Granite	26.4	12.93	61.7	34.2	-48.45
McKensie	30.3	11.11	63.0	35.7	-49.61
Dapps	26.1	13.34	61.0	31.8	-56.93
Steele ND	29.6	11.71	63.3	29.5	-75.90
average	28.3	11.50	62.0	39.9	
p value	<0.001	0.011	0.087	<0.001	
CV (S/Mean)	6.8	9.4	2.0	11.4	
CV(SE/Mean)	3.9	5.4	1.1	6.6	
LSD 0.05	3.2	1.79	2.0	7.5	

¹ Wheat prices summarized by G. Carlson, NARC, Havre, MT, from 10-year (1994-2003) average daily market values for PNW, supplied by the Montana Wheat and Barley Committee

Table 26. Relative yields of spring wheat varieties as compared to McNeal when grown under dryland conditions in Daniels County in cooperation with CES. Cooperator: Bobbie Roos

Variety	1999	2001	2002	2003	2004	average	As % of McNeal
Amidon	59.5	29.1	25.4	34.3	46.9	39.0	104.3
Outlook	--	26.9	32.0	37.7	42.3	34.7	101.3
McNeal	50.1	28.7	29.4	31.6	47.4	37.4	100.0
Scholar	53.9	28.2	30.6	30.4	43.8	37.4	99.8
Hank	--	--	30.2	33.0	42.9	35.4	97.9
Reeder	51.3	25.0	31.3	35.4	35.9	35.8	95.6
MT0266	--	--	--	--	45.2	45.2	95.4
MT0249	--	--	--	--	44.4	44.4	93.7
NDSW0246	--	--	--	--	43.3	43.3	91.4
MT0245	--	--	--	--	41.7	41.7	88.0
Hanna	--	--	--	--	40.9	40.9	86.3
Ember	--	--	25.1	27.7	39.7	30.8	85.3
Freyr	--	--	--	--	40.1	40.1	84.6
Choteau	--	20.8	23.1	28.2	39.6	27.9	81.5
McKenzie	--	--	26.6	25.0	35.7	29.1	80.5
Norpro	--	--	--	--	37.1	37.1	78.3
ND751	--	--	--	--	36.4	36.4	76.8
Granite	--	--	--	--	34.2	34.2	72.2
Dapps	--	--	--	--	31.8	31.8	67.1
Steele ND	--	--	--	--	29.5	29.5	62.2

NOTE: Average yields in this summary should not be compared to each other since they are not always grown in the same years. Compare yields only to the check variety.
Not harvested in 2000.

Table 27. Relative test weights of spring wheat varieties as compared to McNeal when grown under dryland conditions in Daniels County in cooperation with CES. Cooperator: Bobbie Roos

Variety	1999	2001	2002	2003	2004	average	As % of McNeal
Ember	--	--	63.8	64.0	63.3	63.7	104.5
Steele ND	--	--	--	--	63.3	63.3	102.9
MT0249	--	--	--	--	63.2	63.2	102.8
Reeder	62.9	63.4	61.3	63.0	62.3	62.6	102.3
McKenzie	--	--	61.2	61.6	63.0	61.9	101.6
Choteau	--	63.4	60.8	62.3	61.7	62.1	101.6
Hanna	--	--	--	--	62.5	62.5	101.6
Scholar	62.7	62.6	59.8	62.7	63.0	62.2	101.6
Hank	--	--	60.8	61.7	62.2	61.6	101.0
MT0266	--	--	--	--	61.8	61.8	100.5
Freyr	--	--	--	--	61.8	61.8	100.5
NDSW0246	--	--	--	--	61.7	61.7	100.3
MT0245	--	--	--	--	61.7	61.7	100.3
Granite	--	--	--	--	61.7	61.7	100.3
McNeal	61.7	61.4	59.8	61.5	61.5	61.2	100.0
Amidon	62.0	62.4	58.8	62.5	60.2	61.2	100.0
Norpro	--	--	--	--	61.5	61.5	100.0
Outlook	--	61.8	59.7	61.3	60.5	60.8	99.6
ND751	--	--	--	--	61.2	61.2	99.5
Dapps	--	--	--	--	61.0	61.0	99.2

NOTE: Average yields in this summary should not be compared to each other since they are not always grown in the same years. Compare yields only to the check variety.
Not harvested in 2000.

Table 28. Relative protein contents of spring wheat varieties as compared to McNeal when grown under dryland conditions in Daniels County in cooperation with CES. Cooperator: Bobbie Roos

Variety	1999	2001	2002	2003	2004	average	As % of McNeal
Dapps	--	--	--	--	13.3	13.3	118.8
Granite	--	--	--	--	12.9	12.9	115.2
Reeder	10.4	11.7	12.4	14.7	13.4	12.5	114.0
MT0266	--	--	--	--	12.2	12.2	108.9
Freyr	--	--	--	--	12.2	12.2	108.9
Amidon	10.0	10.4	12.3	14.0	11.9	11.7	106.7
Steele ND	--	--	--	--	11.7	11.7	104.5
NDSW0246	--	--	--	--	11.6	11.6	103.6
MT0245	--	--	--	--	11.5	11.5	102.7
Scholar	10.2	10.3	11.6	13.4	10.5	11.2	102.0
Choteau	--	8.8	12.3	13.9	11.2	11.6	102.0
Outlook	--	9.7	11.4	13.1	12.0	11.6	102.0
McKenzie	--	--	11.8	13.0	11.1	12.0	101.1
McNeal	9.6	9.8	10.7	13.6	11.2	11.0	100.0
Hanna	--	--	--	--	11.1	11.1	99.1
Hank	--	--	11.2	13.0	10.6	11.6	98.0
Norpro	--	--	--	--	10.8	10.8	96.4
ND751	--	--	--	--	10.6	10.6	94.6
Ember	--	--	10.6	12.8	10.0	11.1	94.1
MT0249	--	--	--	--	10.3	10.3	92.0

NOTE: Average yields in this summary should not be compared to each other since they are not always grown in the same years. Compare yields only to the check variety. Not harvested in 2000.

Table 29. Performance of spring wheat grown under flood irrigated conditions at Nashua, MT.
 Planted: Apr 22, 2004 Harvested: Aug 26, 2004 Cooperators: Alisha (Zeller) & Cole Sibley

Variety	Height, inches	Grain protein	Test weight	Yield, bu/acre	\$/acre ¹ +/- McNeal
Hank	34.5	10.85	59.8	66.9	56.16
Reeder	37.8	11.83	60.8	61.4	28.84
MT0245	37.2	12.00	59.8	59.6	21.20
NDSW0246	45.5	11.28	61.8	59.4	20.36
Outlook	35.7	10.48	60.0	58.6	16.96
MT0249	33.6	10.89	61.0	56.9	9.76
MT0266	37.8	11.72	58.0	55.6	4.24
Dapps	43.6	12.62	60.2	54.1	3.84
McNeal	35.9	10.10	61.0	54.6	0.00
Hanna	42.4	10.55	61.5	54.6	0.00
Steele ND	38.9	10.45	62.0	54.6	0.00
Amidon	46.2	10.22	60.8	54.4	-0.84
Freyr	36.0	11.42	61.0	54.1	-2.12
Ember	38.1	9.06	62.3	52.6	-8.48
ND751	38.0	11.49	63.0	51.4	-13.56
Scholar	44.2	10.46	61.5	51.0	-15.26
Granite	34.9	11.33	63.5	48.8	-24.59
Choteau	35.4	10.92	60.7	48.4	-26.28
Norpro	33.6	10.28	61.2	46.3	-35.19
McKensie	42.5	10.85	60.7	41.7	-54.69
average	38.6	10.94	61.0	54.3	
p value	<0.001	<0.001	<0.001	0.008	
CV (S/Mean)	5.1	6.5	1.2	11.4	
CV(SE/Mean)	2.9	3.7	0.7	6.6	
LSD 0.05	3.23	1.17	1.2	10.2	

¹ Wheat prices summarized by G. Carlson, NARC, Havre, MT, from 10-year (1994-2003) average daily market values for PNW, supplied by the Montana Wheat and Barley Committee

Table 30. Relative yielding abilities of spring wheat varieties as compared to McNeal when grown under irrigated conditions in Valley County in cooperation with CES.
Cooperators: Alisha (Zeller) & Cole Sibley

Cultivar	2003	2004	Ave	as % of McNeal
Reeder	80.0	61.4	70.7	112.4
Hank	69.5	66.9	68.2	108.4
Outlook	74.7	58.6	66.7	106.0
Amidon	75.7	54.4	65.1	103.5
McNeal	71.1	54.6	62.9	100.0
Scholar	74.2	51.0	62.6	99.5
MT0245	--	59.6	59.6	94.8
NDSW0246	--	59.4	59.4	94.4
Choteau	68.9	48.4	58.7	93.3
Ember	64.4	52.6	58.5	93.0
MT0249	--	56.9	56.9	90.5
McKenzie	69.8	41.7	55.8	88.7
MT0266	--	55.6	55.6	88.4
Hanna	--	54.6	54.6	86.8
Steele ND	--	54.6	54.6	86.8
Freyr	--	54.1	54.1	86.0
Dapps	--	54.1	54.1	86.0
ND751	--	51.4	51.4	81.7
Granite	--	48.8	48.8	77.6
Norpro	--	46.3	46.3	73.6

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 31. Relative test weights of spring wheat varieties as compared to McNeal when grown under irrigated conditions in Valley County in cooperation with CES.

Cooperators: Alisha (Zeller) & Cole Sibley

Cultivar	2003	2004	Ave	as % of McNeal
Granite	--	63.5	63.5	104.1
ND751	--	63.0	63.0	103.3
Ember	63.8	62.3	63.1	102.6
Steele ND	--	62.0	62.0	101.6
Scholar	63.0	61.5	62.3	101.3
NDSW0246	--	61.8	61.8	101.3
Hanna	--	61.5	61.5	100.8
Reeder	63.0	60.8	61.9	100.6
Choteau	62.8	60.7	61.8	100.5
Norpro	--	61.2	61.2	100.3
McKenzie	62.5	60.7	61.6	100.2
McNeal	62.0	61.0	61.5	100.0
Amidon	62.2	60.8	61.5	100.0
MT0249	--	61.0	61.0	100.0
Freyr	--	61.0	61.0	100.0
Outlook	61.5	60.0	60.8	98.9
Dapps	--	60.2	60.2	98.7
Hank	61.2	59.8	60.5	98.4
MT0245	--	59.8	59.8	98.0
MT0266	--	58.0	58.0	95.1

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 32. Relative protein contents of spring wheat varieties as compared to McNeal when grown under irrigated conditions in Valley County in cooperation with CES.

Cooperators: Alisha (Zeller) & Cole Sibley

Cultivar	2003	2004	Ave	as % of McNeal
Dapps	--	12.6	12.6	124.7
MT0245	--	12.0	12.0	118.8
Reeder	14.5	11.8	13.2	115.8
MT0266	--	11.7	11.7	115.8
ND751	--	11.5	11.5	113.9
Freyr	--	11.4	11.4	112.9
NDSW0246	--	11.3	11.3	111.9
Granite	--	11.3	11.3	111.9
Scholar	14.4	10.5	12.5	109.6
McKenzie	14.0	10.9	12.5	109.6
MT0249	--	10.9	10.9	107.9
Hank	13.2	10.9	12.1	106.1
Choteau	13.3	10.9	12.1	106.1
Outlook	13.4	10.5	12.0	105.3
Amidon	13.8	10.2	12.0	105.3
Hanna	--	10.6	10.6	105.0
Steele ND	--	10.5	10.5	104.0
Norpro	--	10.3	10.3	102.0
McNeal	12.6	10.1	11.4	100.0
Ember	13.3	9.1	11.2	98.2

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.