PROJECT TITLE: Evaluation of spring wheat variety performance in irrigated and dryland off-station trials in six counties in eastern Montana.

PROJECT LEADER:

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Victor Wagner, cooperator
Mark Swank, cooperator
Max Aasheim, cooperator
Steve Brekke, cooperator
Dave Maus, cooperator
Kenny Benson, cooperator

OBJECTIVE: To evaluate new varieties of spring wheat in different environments in eastern Montana, and to compare experimental lines and new varieties with current varieties.

MATERIALS AND METHODS: Twenty-four spring wheat varieties were planted at five 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. The irrigated site in Sheridan County was not harvested because the cooperator mistakenly harvested the plots. Planting and harvest dates were

Location	Planted	Harvested
Circle, McCone County – dryland	29 April	13 August
Wibaux, Wibaux County – dryland	14 May	3 September
Poplar, Roosevelt County – dryland	8 May	27 August
Reserve, Sheridan County – dryland	8 May	2 September
Nashua, Valley County – dryland	5 May	4 September
Scobey, Daniels County – irrigated	7 May	5 September
Larslan, Valley County – irrigated	6 May	4 September
Dagmar, Sheridan County – irrigated	9 May	not harvested

RESULTS: Summaries of yields, test weights, heights and protein contents across off-station trials are shown in Tables 1-4. The highest yielding variety across the dryland sites was MT9433, and the highest yielding variety across the irrigated sites was Verde.

McCone County, Circle, dryland, cooperator: Victor Wagner. Table 5. The experimental site was planted in spring wheat in 1996. Plots were planted on 29 April and harvested on 13 August. Keene and MT9433 had the greatest value at this site. The average yield was 18.4 bu/acre. Five year summaries for yield, test weight, and protein are shown in Tables 6-8.

Wibaux County, Wibaux, dryland, cooperator: David Maus. Table 9. The experimental site was fallow in 1996. Plots were planted on 14 May and harvested on 3 Sep. Varieties with the greatest values at this site were 2398 and Amidon. The average yield was 40.7 bu/acre. Five year summaries for yield, test weight, and protein are shown in Tables 10-12.

Roosevelt County, Poplar, dryland, cooperator: Mark Swank. Table 13. The experimental site was fallow in 1996. Plots were planted on 8 May and harvested on 27 August. Varieties with the greatest value at this site were 2398 and Keene. The average yield was 22.6 bu/acre. Five year summaries for yield, test weight, and protein are shown in Tables 14-16.

Sheridan County, Reserve, dryland, cooperator: Max Aasheim. Table 17. The experimental site was fallow in 1996. Plots were planted on 8 May and harvested on 2 Sep. MT9433 and 2398 had the greatest value at this site. The average yield was 27.9 bu/acre. Five year summaries for yield, test weight, and protein are shown in Tables 18-20.

Valley County, Nashua, dryland, cooperator: Bill Lauckner. Table 21. The experimental site was fallow in 1996. Plots were planted on 5 May and harvested on 4 Sep. Grandin and McNeal had the greatest value at this site. Average yield was 31.9 bu/acre. Five year summaries for yield, test weight, and protein are shown in Tables 22-24.

Daniels County, Scobey, irrigated, cooperator: Kenny Benson. Tables 25. The experimental site is under pivot irrigation. Plots were planted on 7 May and harvested on 5 Sep. Ernest and Trenton had the greatest value. Average yield was 45.6 bu/acre. . Two year summaries for yield, test weight, and protein are shown in Tables 26-28.

Valley County, Larslan, irrigated, cooperator:. Kelly Donovan. Table 29. The experimental site is under pivot irrigation. Plots were planted on 6 May and harvested on 4 Sep. Kulm and Grandin had the greatest value. The average yield was 94.5 bu/acre. Five year summaries for yield, test weight, and protein are shown in Tables 30-32.

SUMMARY: The greatest yielding variety across dryland sites was MT9433, and the greatest yielding variety across irrigated sites was Verde. Greatest yielding varieties at individual dryland sites were Keene (Circle), Verde (Wibaux), 2398 (Poplar), MT9433 (Reserve), and Grandin (Nashua). Greatest yielding varieties at individual irrigated sites were Ernest (Scobey) and 2375 (Larslan).

FUTURE PLANS: New varieties will continue to be evaluated and compared with existing varieties at these off-station sites. Closer cooperation with the Williston Research Center will result in the inclusion of experimental lines from North Dakota as well as Montana in these tests, so that information about their performance will be available when the lines are released as varieties.

Table 1. Summary of spring wheat yields in bu/acre at five dryland and two irrigated off-station sites in eastern Montana, 1997.

	dryland						irrigated		
Variety	Circle	Wibaux	Poplar	Reserve	Nashua	average	Scobey	Larslan	average
2375	18.6	37.1	23.3	29.4	28.0	27.3	49.3	106.7	78.0
2398	17.6	45.2	27.1	33.5	35.8	31.8	54.9	103.5	79.2
AC Barrie	19.4	42.0	25.8	29.7	32.3	29.8	49.3	92.4	70.8
Amidon	21.3	44.4	26.5	31.4	38.7	32.5	49.9	94.3	72.1
Ernest	19.9	34.5	21.2	26.4	28.3	26.1	56.2	99.2	77.7
Express	12.8	39.0	21.8	26.2	25.3	25.0	47.5	100.2	73.8
Grandin	19.1	41.9	23.1	26.8	39.4	30.1	45.0	103.5	74.2
Hamer	17.1	42.9	22.6	27.1	29.0	27.7	42.6	102.5	72.6
Keene	24.1	44.2	26.1	30.0	34.0	31.7	52.3	100.1	76.2
Kulm	18.3	36.5	19.6	28.2	31.1	26.7	42.7	106.3	74.5
Lars	17.8	40.7	23.6	31.4	31.4	29.0	41.5	101.9	71.7
Len	17.9	43.1	22.6	29.3	31.8	28.9	45.3	88.9	67.1
Lew	17.3	37.6	22.0	26.9	32.3	27.2	40.3	66.8	53.6
McNeal	18.4	41.4	25.8	33.2	38.5	31.5	52.3	99.5	75.9
MT9433	23.6	43.5	25.5	33.6	36.8	32.6	53.4	87.5	70.4
MT9508	17.7	37.4	17.9	22.0	26.6	24.3	35.6	78.6	57.1
MTHW9520	18.6	44.1	19.9	32.3	33.5	29.7	44.7	91.2	68.0
MTWH9420	17.5	37.1	18.3	19.2	30.9	24.6	34.8	100.6	67.7
Newana	15.2	43.8	22.3	25.5	34.3	28.2	32.2	94.9	63.6
Norlander	18.3	43.6	21.5	23.9	32.3	27.9	44.7	90.0	67.4
Trenton	18.0	42.4	22.8	29.4	34.4	29.4	54.2	97.0	75.6
Verde	20.1	46.2	23.0	33.0	25.9	29.6	54.0	106.7	80.4
Westbred 926	16.6	35.9	19.3	20.0	27.5	23.9	36.4	87.4	61.9
Westbred 936	16.3	33.2	21.7	20.3	31.1	24.5	35.6	81.2	58.4
Tioga					28.7				
NK 751								82.0	
Penewawa							45.8		
site average	18.4	40.7	22.6	27.9	31.9		45.6	94.5	
p value	0.000	0.001	0.000	0.000	0.000		0.000	0.000	
CV (S/Mean)	10.5	9.2	10.2	8.2	10.5		9.7	9.1	
CV(SE/Mean)	6.1	5.3	5.9	4.7	6.1		5.6	5.2	
LSD 0.05	3.2	6.1	3.8	3.7	5.5		7.2	14.1	
Planting date	29 Apr	14 May	8 May	8 May	5 May		7 May	6 May	
Harvest date	13 Aug	3 Sept	27 Aug	2 Sep	4 Sept		5 Sep	4 Sept	

Cooperators:
Circle, MT, McCone Co. - Victor Wagner
Wibaux, MT, Wibaux Co. - David Maus
Poplar, MT, Roosevelt Co. - Mark Swank
Reserve, MT, Sheridan Co. - Max Aasheim
Nashua, MT, Valley Co. - Bill Lauckner
Scobey, MT, Daniels Co. - Kenny Benson
Larslan, MT, Valley Co. - Kelly Donovan

Table 2. Summary of spring wheat test weights in lb/bu at five dryland and two irrigated off-station sites in eastern Montana, 1997.

	dryland						irrigated		
Variety	Circle	Wibaux	Poplar	Reserve	Nashua	average	Scobey	Larslan	average
2375	63.9	60.8	63.3	60.0	58.8	61.4	59.3	62.0	60.6
2398	63.7	60.5	61.8	59.7	58.2	60.8	60.2	60.0	60.1
AC Barrie	63.5	59.5	61.2	60.2	58.8	60.6	58.8	61.8	60.3
Amidon	63.2	60.0	62.0	60.0	58.3	60.7	61.0	60.3	60.6
Ernest	64.4	59.8	63.3	61.4	58.3	61.4	60.8	61.2	61.0
Express	62.9	58.7	62.9	58.9	58.2	60.3	58.2	58.0	58.1
Grandin	65.2	60.5	64.1	61.6	59.3	62.1	61.0	60.2	60.6
Hamer	64.4	60.2	63.3	60.0	58.8	61.3	59.3	60.3	59.8
Keene	63.5	61.5	62.3	61.0	59.0	61.5	61.7	62.7	62.2
Kulm	65.4	62.0	64.7	61.7	60.0	62.8	61.0	62.0	61.5
Lars	63.1	58.3	62.1	58.7	58.0	60.0	56.2	59.5	57.8
Len	64.0	59.2	64.1	60.0	58.5	61.2	59.2	58.7	59.0
Lew	63.8	61.2	64.0	60.5	59.3	61.8	60.5	59.7	60.1
McNeal	61.5	58.7	60.8	60.0	58.2	59.8	60.2	60.3	60.2
MT9433	63.6	60.8	62.8	61.0	59.0	61.4	61.2	59.2	60.2
MT9508	63.7	60.5	63.9	61.9	58.3	61.7	60.3	60.7	60.5
MTHW9520	62.5	59.3	62.7	59.7	59.0	60.6	57.8	58.7	58.2
MTWH9420	64.4	58.8	64.2	60.6	58.5	61.3	57.3	57.3	57.3
Newana	63.7	59.7	64.7	61.7	59.3	61.8	57.3	59.7	58.5
Norlander	64.8	60.2	63.1	60.6	57.7	61.3	58.3	58.3	58.3
Trenton	65.3	60.3	63.0	61.2	59.5	61.9	60.8	60.3	60.6
Verde	64.6	60.2	62.3	60.7	58.7	61.3	59.0	58.8	58.9
Westbred 926	64.2	59.3	63.7	61.4	59.0	61.5	57.8	59.0	58.4
Westbred 936	63.2	59.3	64.1	59.0	58.5	60.8	56.8	55.3	56.0
Tioga					58.2				
NK 751								56.8	
Penewawa							56.8		
site average	63.8	60.0	63.1	60.5	58.7		59.2	59.6	
p value	0.000	0.000	0.000	0.000	0.000		0.000	0.000	
CV (S/Mean)	1.0	1.1	1.2	1.1	0.4		0.9	1.5	
CV(SE/Mean)	0.6	0.6	0.7	0.7	0.2		0.5	0.9	
LSD 0.05	1.1	1.1	1.2	1.1	0.4		0.9	1.5	
Planting date	29 Apr	14 May	8 May	8 May	5 May		7 May	6 May	
Harvest date	13 Aug	3 Sept	27 Aug	2 Sep	4 Sept		5 Sep	4 Sept	

Cooperators: Circle, MT, McCone Co. - Victor Wagner
Wibaux, MT, Wibaux Co. - David Maus
Poplar, MT, Roosevelt Co. - Mark Swank
Reserve, MT, Sheridan Co. - Max Aasheim
Nashua, MT, Valley Co. - Bill Lauckner
Scobey, MT, Daniels Co. - Kenny Benson
Larslan, MT, Valley Co. - Kelly Donovan

Table 3. Summary of spring wheat heights in inches at five dryland and two irrigated off-station sites in eastern Montana, 1997.

	dryland						irrigated		
Variety	Circle	Wibaux	Poplar	Reserve	Nashua	average	Scobey	Larslan	average
2375	17	25	19	21	20	20.4	35	34	34.5
2398	16	24	17	20	18	19.0	29	31	30.0
AC Barrie	19	31	22	24	21	23.4	35	38	36.5
Amidon	20	32	23	26	22	24.6	38	36	37.0
Ernest	20	30	23	25	21	23.8	36	38	37.0
Express	16	24	18	19	18	19.0	26	28	27.0
Grandin	18	29	20	23	23	22.6	32	35	33.5
Hamer	17	25	19	20	18	19.8	29	31	30.0
Keene	21	32	21	23	22	23.8	36	39	37.5
Kulm	18	26	20	21	22	21.4	33	37	35.0
Lars	17	24	18	18	17	18.8	26	30	28.0
Len	19	29	22	22	21	22.6	29	33	31.0
Lew	19	34	25	29	23	26.0	37	40	38.5
McNeal	18	26	22	24	20	22.0	33	33	33.0
MT9433	20	30	23	25	21	23.8	33	35	34.0
MT9508	18	27	19	21	21	21.2	29	33	31.0
MTHW9520	18	26	21	23	20	21.6	27	29	28.0
MTWH9420	16	24	19	19	18	19.2	30	33	31.5
Newana	17	27	20	22	19	21.0	27	32	29.5
Norlander	18	24	20	20	21	20.6	29	30	29.5
Trenton	19	29	20	25	21	22.8	38	38	38.0
Verde	18	27	21	22	20	21.6	30	33	31.5
Westbred 926	17	24	18	19	20	19.6	28	30	29.0
Westbred 936	17	22	16	18	19	18.4	25	28	26.5
Tioga					23				
NK 751								26	
Penewawa							28		
site average	18.0	27.1	20.3	22.2	20.4		31.1	33.2	
p value	0.000	0.000	0.000	0.000	0.000		0.000	0.000	
CV (S/Mean)	6.0	6.6	5.9	5.6	7.6		7.0	4.4	
CV(SE/Mean)	3.5	3.8	3.4	3.3	4.4		4.0	2.6	
LSD 0.05	1.8	3.0	2.0	2.1	2.5		3.6	2.4	
Planting date	29 Apr	14 May	8 May	8 May	5 May		7 May	6 May	
Harvest date	13 Aug	3 Sept	27 Aug	2 Sep	4 Sept		5 Sep	4 Sept	

Cooperators: Circle, MT, McCone Co. - Victor Wagner
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Larslan, MT, Valley Co. - Kelly Donovan

Table 4. Summary of spring wheat grain protein contents as percent at five dryland and two irrigated off-station sites in eastern Montana, 1997.

	dryland						irrigated		
Variety	Circle	Wibaux	Poplar	Reserve	Nashua	average	Scobey	Larslan	average
2375	13.6	14.4	15.0	13.2	15.8	14.40	13.2	12.8	13.00
2398	13.8	14.1	14.5	14.0	15.8	14.44	13.5	13.2	13.35
AC Barrie	14.6	14.1	15.5	14.8	16.0	15.00	14.4	14.5	14.45
Amidon	13.5	14.2	14.6	13.6	14.6	14.10	13.8	13.2	13.50
Ernest	14.0	14.6	15.6	14.2	15.5	14.78	14.0	13.7	13.85
Express	15.0	14.0	15.2	13.4	16.2	14.76	13.7	13.6	13.65
Grandin	13.8	14.3	15.5	14.7	15.3	14.72	13.9	13.7	13.80
Hamer	13.9	13.8	15.5	13.5	15.5	14.44	13.0	12.9	12.95
Keene	13.7	13.2	15.2	14.4	16.1	14.52	13.8	13.8	13.80
Kulm	13.5	14.6	16.1	14.8	16.9	15.18	14.1	13.8	13.95
Lars	13.5	13.4	14.6	13.7	14.8	14.00	13.4	12.6	13.00
Len	14.2	13.9	15.0	14.4	15.7	14.64	13.9	14.0	13.95
Lew	13.4	13.3	15.0	13.5	14.4	13.92	13.3	14.8	14.05
McNeal	13.5	14.1	15.7	13.8	16.4	14.70	13.8	13.8	13.80
MT9433	13.7	14.4	15.2	14.3	16.4	14.80	13.9	14.9	14.40
MT9508	13.7	13.8	15.6	14.2	16.2	14.70	13.3	13.8	13.55
MTHW9520	14.0	13.9	14.8	13.6	15.4	14.34	13.4	12.9	13.15
MTWH9420	13.8	13.6	15.0	13.9	15.5	14.36	13.2	14.1	13.65
Newana	12.8	13.1	14.8	13.4	14.8	13.78	13.2	13.0	13.10
Norlander	14.7	14.2	15.8	14.6	15.8	15.02	13.8	13.2	13.50
Trenton	13.0	14.2	15.4	14.2	15.2	14.40	14.1	13.9	14.00
Verde	13.8	12.4	14.8	13.6	14.9	13.90	12.8	13.0	12.90
Westbred 926	13.5	13.9	15.3	14.2	16.1	14.60	14.1	13.2	13.65
Westbred 936	13.7	13.8	15.4	14.2	16.0	14.62	13.6	14.2	13.90
Tioga					16.0				
NK 751								12.6	
Penewawa							11.8		
site average	13.8	13.9	15.2	14.0	15.6		13.6	13.6	
p value	NS	0.000	NS	0.000	0.000		0.000	0.000	
CV (S/Mean)	6.3	3.1	3.6	1.6	2.1		2.4	3.7	
CV(SE/Mean)	3.6	1.8	2.1	0.9	1.2		1.4	2.2	
LSD 0.05	--	0.7	--	0.4	0.5		0.5	0.83	
Planting date	29 Apr	14 May	8 May	8 May	5 May		7 May	6 May	
Harvest date	13 Aug	3 Sept	27 Aug	2 Sep	4 Sept		5 Sep	4 Sept	

Cooperators: Circle, MT, McCone Co. - Victor Wagner
Wibaux, MT, Wibaux Co. - David Maus
Poplar, MT, Roosevelt Co. - Mark Swank
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Nashua, MT, Valley Co. - Bill Lauckner
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Larslan, MT, Valley Co. - Kelly Donovan

Table 5. Performance of spring wheat grown under dryland continuous cropping conditions at Circle, MT. Planted: 29 April 1997 Harvested: 13 August 1997 Cooperator: Victor Wagner

Variety	Height, inches	Test weight	Grain protein	Yield, bu/acre	$/acre[1] +/- McNeal
Keene	21	63.5	13.7	24.1	25.76
MT9433	20	63.6	13.7	23.6	23.50
Amidon	20	63.2	13.5	21.3	13.11
Ernest	20	64.4	14.0	19.9	9.76
Verde	18	64.6	13.8	20.1	9.29
AC Barrie	19	63.5	14.6	19.4	9.17
Grandin	18	65.2	13.8	19.1	4.69
Norlander	18	64.8	14.7	18.3	3.94
2375	17	63.9	13.6	18.6	0.90
Len	19	64.0	14.2	17.9	0.42
McNeal	18	61.2	13.5	18.4	0.00
Kulm	18	65.4	13.5	18.3	-0.45
2398	16	63.7	13.8	17.6	-2.21
Lars	17	63.1	13.5	17.8	-2.71
MT9508	18	63.7	13.7	17.7	-3.17
Trenton	19	65.3	13.0	18.0	-4.51
Hamer	17	64.4	13.9	17.1	-4.51
Lew	19	63.8	13.4	17.3	-6.36
Westbred 926	17	64.2	13.5	16.6	-8.14
Westbred 936	17	63.2	13.7	16.3	-9.49
Newana	17	63.7	12.8	15.2	-17.81
Express	16	62.9	15.0	12.8	-21.09
MTHW9520	18	62.5	14.0	18.6	*
MTHW9420	16	64.4	13.8	17.5	*
average	18.0	63.8	13.79	18.4	
p value	0.000	0.000	NS	0.000	
CV (S/Mean)	6.0	1.0	6.3	10.5	
CV(SE/Mean)	3.5	0.6	3.6	6.1	
LSD 0.05	1.8	1.1	--	3.2	

[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 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	# of years	1993	1994	1995	1996	1997	Ave	as % of McNeal
MT9433	1	--	--	--	--	23.6	23.6	128.3
Keene	2	--	--	--	17.0	24.1	20.6	118.8
Verde	1	--	--	--	--	20.1	20.1	109.2
AC Barrie	1	--	--	--	--	19.4	19.4	105.4
2398	2	--	--	--	17.4	17.6	17.5	101.2
Amidon	5	40.8	32.1	32.6	19.5	21.3	29.3	101.1
MTHW9520	1	--	--	--	--	18.6	18.6	101.1
Ernest	4	--	30.8	28.6	17.7	19.9	24.2	101.0
McNeal	5	48.7	32.0	29.4	16.2	18.4	28.9	100.0
Trenton	3	--	--	25.7	19.0	18.0	20.9	98.0
Len	1	--	--	--	--	17.9	17.9	97.3
Norlander	3	--	--	25.5	17.8	18.3	20.5	96.2
MT9508	1	--	--	--	--	17.7	17.7	96.2
MTHW9420	1	--	--	--	--	17.5	17.5	95.1
Lars	3	--	--	26.1	16.3	17.8	20.1	94.1
2375	5	38.6	35.1	28.6	15.0	18.6	27.2	93.9
Stoa	4	41.2	29.5	30.5	17.4	--	29.6	93.9
Westbred 936	3	--	--	27.9	14.9	16.3	19.7	92.3
Lew	5	38.5	33.1	28.5	16.0	17.3	26.7	92.2
Kulm	4	--	30.2	23.6	16.1	18.3	22.0	91.9
Westbred 926	3	--	--	24.5	16.8	16.6	19.3	90.5
Hamer	3	--	--	25.9	14.8	17.1	19.3	90.3
Sonja	3	--	26.2	26.5	15.4	--	22.7	87.8
Grandin	5	39.9	25.4	25.0	16.3	19.1	25.1	86.9
Newana	5	35.0	27.8	26.8	14.6	15.2	23.9	82.5
Express	3	--	--	21.7	14.8	12.8	16.4	77.0
Hi-Line	4	32.8	20.6	22.5	15.9	--	23.0	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	# of years	1993	1994	1995	1996	1997	Ave	as % of McNeal
Verde	1	--	--	--	--	64.6	64.6	105.6
MTHW9420	1	--	--	--	--	64.4	64.4	105.2
Len	1	--	--	--	--	64.0	64.0	104.6
Keene	2	--	--	--	63.2	63.5	63.4	104.3
MT9508	1	--	--	--	--	63.7	63.7	104.1
Kulm	4	--	64.2	64.0	63.2	65.4	64.2	104.0
MT9433	1	--	--	--	--	63.6	63.6	103.9
AC Barrie	1	--	--	--	--	63.5	63.5	103.8
Trenton	3	--	--	64.3	62.1	65.3	63.9	103.7
Norlander	3	--	--	63.3	63.2	64.8	63.8	103.5
Hamer	3	--	--	63.4	63.1	64.4	63.6	103.3
2398	2	--	--	--	61.8	63.7	62.8	103.3
Grandin	5	61.1	63.8	64.5	62.7	65.2	63.5	103.2
Ernest	4	--	64.2	63.2	63.0	64.4	63.7	103.2
Westbred 926	3	--	--	63.2	61.6	64.2	63.0	102.3
MTHW9520	1	--	--	--	--	62.5	62.5	102.1
Lew	5	60.8	62.9	63.8	62.4	63.8	62.7	102.0
Newana	5	58.7	63.9	64.1	62.8	63.7	62.6	101.8
2375	5	59.9	63.8	63.8	61.6	63.9	62.6	101.8
Westbred 936	3	--	--	62.7	62.1	63.2	62.7	101.7
Express	3	--	--	62.4	62.4	62.9	62.6	101.6
Lars	3	--	--	62.4	61.7	63.1	62.4	101.3
Amidon	5	59.3	62.5	63.8	62.4	63.2	62.2	101.2
Sonja	3	--	62.7	62.8	61.5	--	62.3	100.6
Hi-Line	4	57.9	64.3	62.5	62.5	--	61.8	100.3
Stoa	4	58.8	62.8	62.9	62.1	--	61.6	100.1
McNeal	5	60.6	62.2	63.3	60.3	61.2	61.5	100.0

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 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	# of years	1993	1994	1995	1996	1997	Ave	as % of McNeal
AC Barrie	1	--	--	--	--	14.6	14.60	108.1
Len	1	--	--	--	--	14.2	14.20	105.2
Hamer	3	--	--	14.2	14.0	13.9	14.03	104.2
Express	3	--	--	14.6	12.4	15.0	14.00	104.0
Kulm	4	--	11.7	14.0	13.2	13.5	13.10	103.8
MTHW9520	1	--	--	--	--	14.0	14.00	103.7
Norlander	3	--	--	14.2	12.8	14.7	13.90	103.2
Hi-Line	4	15.9	11.2	13.8	12.9	--	13.45	102.7
Ernest	4	--	10.8	14.0	12.8	14.0	12.90	102.2
Verde	1	--	--	--	--	13.8	13.80	102.2
MTHW9420	1	--	--	--	--	13.8	13.80	102.2
MT9433	1	--	--	--	--	13.7	13.70	101.5
MT9508	1	--	--	--	--	13.7	13.70	101.5
Westbred 936	3	--	--	13.4	13.7	13.7	13.60	101.0
Keene	2	--	--	--	13.1	13.7	13.40	100.8
2398	2	--	--	--	12.9	13.8	13.35	100.4
Grandin	5	16.0	10.3	13.3	12.6	13.8	13.20	100.2
McNeal	5	15.4	10.1	13.8	13.1	13.5	13.18	100.0
Westbred 926	3	--	--	13.8	13.1	13.5	13.47	100.0
Stoa	4	16.2	10.0	13.4	12.6	--	13.05	99.6
Trenton	3	--	--	13.5	13.6	13.0	13.37	99.3
Sonja	3	--	10.1	13.2	13.0	--	12.10	98.1
Lew	5	14.6	10.0	12.9	12.5	13.4	12.68	96.2
2375	5	15.0	9.8	12.7	12.1	13.6	12.64	95.9
Lars	3	--	--	13.3	11.9	13.5	12.90	95.8
Amidon	5	14.4	10.7	12.8	11.6	13.5	12.60	95.6
Newana	5	14.0	9.9	13.1	12.6	12.8	12.48	94.7

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 9. Performance of spring wheat grown under dryland conditions at Wibaux, MT.
Planted: 14 May 1997, Harvested: 3 September 1997
Cooperator: David Maus

Variety	Height, inches	Test weight	Grain protein	Yield, bu/acre	$/acre[1] +/- McNeal
2398	24	60.5	14.1	45.2	17.74
Amidon	32	60.0	14.2	44.4	14.01
MT9433	30	60.8	14.4	43.5	11.98
Norlander	24	60.2	14.2	43.6	10.27
Len	29	59.2	13.9	43.1	4.92
Trenton	29	60.3	14.2	42.4	4.67
Grandin	29	60.5	14.3	41.9	4.43
Hamer	25	60.2	13.8	42.9	4.00
AC Barrie	31	59.5	14.1	42.0	2.80
McNeal	26	58.7	14.1	41.4	0.00
Keene	32	61.5	13.2	44.2	-0.19
Newana	27	59.7	13.1	43.8	-1.93
Verde	27	60.2	12.4	46.2	-2.53
Express	24	58.7	14.0	39.0	-11.21
Lars	24	58.3	13.4	40.7	-12.63
2375	25	60.8	14.4	37.1	-18.23
Kulm	26	62.0	14.6	36.5	-19.60
MT9508	27	60.5	13.8	37.4	-21.30
Lew	34	61.2	13.3	37.6	-26.40
Westbred 926	24	59.3	13.9	35.9	-28.20
Ernest	30	59.8	14.6	34.5	-29.12
Westbred 936	22	59.3	13.8	33.2	-40.62
MTHW9520	26	59.3	13.9	44.1	*
MTHW9420	24	58.8	13.6	37.1	*
average	27.1	60.0	13.89	40.7	
p value	0.000	0.000	0.000	0.001	
CV (S/Mean)	6.6	1.1	3.1	9.2	
CV(SE/Mean)	3.8	0.6	1.8	5.3	
LSD 0.05	3.0	1.1	0.7	6.1	

[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 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	# of years	1992	1993	1995	1996	1997	Ave	as % of McNeal
Verde	1	--	--	--	--	46.2	46.2	111.6
MTHW9520	1	--	--	--	--	44.1	44.1	106.5
MT9433	1	--	--	--	--	43.5	43.5	105.1
Len	1	--	--	--	--	43.1	43.1	104.1
Pioneer 2398	2	--	--	--	37.5	45.2	41.4	103.9
AC Barrie	1	--	--	--	--	42.0	42.0	101.4
McNeal	5	59.1	44.3	32.8	38.2	41.4	43.2	100.0
Amidon	5	71.9	33.2	28.6	33.4	44.4	42.3	98.0
Trenton	3	--	--	30.8	33.6	42.4	35.6	95.0
Norlander	3	--	--	29.8	33.3	43.6	35.6	94.9
Sonja	2	--	--	32.3	34.9	--	33.6	94.6
Keene	2	--	--	--	30.5	44.2	37.4	93.8
Lars	3	--	--	32.2	31.1	40.7	34.7	92.5
Newana	5	66.2	30.1	25.8	29.4	43.8	39.1	90.5
Pioneer 2375	5	53.9	40.5	27.2	36.5	37.1	39.0	90.5
MT9508	1	--	--	--	--	37.4	37.4	90.3
MTHW9420	1	--	--	--	--	37.1	37.1	89.6
Stoa	3	--	33.9	33.7	34.9	--	34.2	88.9
Ernest	3	--	--	27.8	37.0	34.5	33.1	88.3
Hamer	3	--	--	22.6	33.8	42.9	33.1	88.3
Kulm	3	--	--	31.0	31.5	36.5	33.0	88.1
Lew	5	54.9	36.5	26.1	30.6	37.6	37.1	86.1
Westbred 926	4	50.1	--	20.7	38.4	35.9	36.3	84.6
Grandin	4	--	33.9	24.1	29.8	41.9	32.4	82.8
Westbred 936	3	--	--	23.5	32.7	33.2	29.8	79.5
Hi-Line	4	47.6	35.1	17.5	36.8	--	34.2	78.6
Express	3	--	--	17.7	30.0	39.0	28.9	77.1

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 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	# of years	1992	1993	1995	1996	1997	Ave	as % of McNeal
Keene	2	--	--	--	62.8	61.5	62.2	104.0
Kulm	3	--	--	63.2	63.0	62.0	62.7	103.9
MT943	1	--	--	--	--	60.8	60.8	103.6
MT9508	1	--	--	--	--	60.5	60.5	103.1
Lew	5	63.6	62.8	62.2	62.7	61.2	62.5	102.7
Verde	1	--	--	--	--	60.2	60.2	102.6
Trenton	3	--	--	62.9	62.5	60.3	61.9	102.5
Pioneer 2398	2	--	--	--	61.7	60.5	61.1	102.3
Grandin	4	--	62.3	62.7	61.8	60.5	61.8	102.1
Newana	5	63.2	61.5	62.6	62.7	59.7	61.9	101.8
Norlander	3	--	--	61.8	62.0	60.2	61.3	101.6
Amidon	5	62.4	63.0	62.1	61.5	60.0	61.8	101.5
Pioneer 2375	5	63.4	61.3	61.8	61.7	60.8	61.8	101.5
Hamer	3	--	--	61.7	62.0	60.2	61.3	101.5
AC Barrie	1	--	--	--	--	59.5	59.5	101.4
Ernest	3	--	--	61.4	62.0	59.8	61.1	101.2
MTHW9520	1	--	--	--	--	59.3	59.3	101.0
Len	1	--	--	--	--	59.2	59.2	100.9
Westbred 926	4	63.1	--	61.7	61.0	59.3	61.3	100.8
Hi-Line	4	63.1	60.6	60.8	62.2	--	61.7	100.4
Sonja	2	--	--	61.9	61.0	--	61.4	100.4
MTHW9420	1	--	--	--	--	58.8	58.8	100.2
McNeal	5	62.0	61.2	61.6	60.8	58.7	60.9	100.0
Express	3	--	--	60.7	61.7	58.7	60.4	100.0
Westbred 936	3	--	--	61.0	60.8	59.3	60.4	100.0
Stoa	3	--	60.5	61.6	61.0	--	61.0	99.7
Lars	3	--	--	61.4	60.0	58.3	59.9	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 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	# of years	1992	1993	1995	1996	1997	Ave	as % of McNeal
Hi-Line	4	14.6	13.2	13.0	12.6	--	13.35	103.9
Westbred 926	4	15.2	--	13.4	12.7	13.9	13.80	103.2
Ernest	3	--	--	13.0	12.0	14.6	13.20	102.3
Grandin	4	--	12.8	12.5	12.2	14.3	12.95	102.2
Westbred 936	3	--	--	13.1	12.6	13.8	13.17	102.1
MT9433	1	--	--	--	--	14.4	14.40	102.1
Express	3	--	--	12.1	13.0	14.0	13.03	101.0
Kulm	3	--	--	12.4	12.0	14.6	13.00	100.8
Lew	5	14.4	12.2	13.1	12.6	13.3	13.12	100.2
Pioneer 2375	5	14.6	12.6	12.2	11.8	14.4	13.12	100.2
McNeal	5	14.8	12.0	12.1	12.5	14.1	13.10	100.0
Norlander	3	--	--	12.1	12.4	14.2	12.90	100.0
AC Barrie	1	--	--	--	--	14.1	14.10	100.0
Pioneer 2398	2	--	--	--	12.2	14.1	13.15	98.9
Stoa	3	--	11.8	11.9	12.4	--	12.03	98.6
MTHW9520	1	--	--	--	--	13.9	13.90	98.6
Len	1	--	--	--	--	13.9	13.90	98.6
Amidon	5	14.2	11.6	12.8	11.7	14.2	12.90	98.5
Hamer	3	--	--	12.1	12.2	13.8	12.70	98.4
Trenton	3	--	--	11.8	12.1	14.2	12.70	98.4
MT9508	1	--	--	--	--	13.8	13.80	97.9
Sonja	2	--	--	11.9	12.0	--	11.95	97.2
MTHW9420	1	--	--	--	--	13.6	13.60	96.5
Keene	2	--	--	--	12.3	13.2	12.75	95.9
Lars	3	--	--	11.2	12.1	13.4	12.23	94.8
Newana	5	14.2	11.0	11.3	11.6	13.1	12.24	93.4
Verde	1	--	--	--	--	12.4	12.40	87.9

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: 8 May 1997 Harvested: 27 August 1997 Cooperator: Mark Swank

Variety	Height, inches	Test weight	Grain protein	Yield, bu/acre	$/acre[1] +/- McNeal
2398	17	61.8	14.5	27.1	3.87
Keene	21	62.3	15.2	26.1	1.45
Amidon	23	62.0	14.6	26.5	1.01
McNeal	22	60.8	15.7	25.8	0.00
AC Barrie	22	61.2	15.5	25.8	0.00
MT9433	23	62.8	15.2	25.5	-1.45
2375	19	63.3	15.0	23.3	-12.13
Lars	18	62.1	14.6	23.6	-12.79
Grandin	20	64.1	15.5	23.1	-13.09
Verde	21	62.3	14.8	23.0	-14.50
Trenton	20	63.0	15.4	22.8	-14.55
Len	22	64.1	15.0	22.6	-15.52
Hamer	19	63.3	15.5	22.6	-15.52
Newana	20	64.7	14.8	22.3	-17.87
Lew	25	64.0	15.0	22.0	-18.43
Express	18	62.9	15.2	21.8	-19.40
Westbred 936	16	64.1	15.4	21.7	-19.89
Norlander	20	63.1	15.8	21.5	-20.85
Ernest	23	63.3	15.6	21.2	-22.31
Kulm	20	64.7	16.1	19.6	-30.07
Westbred 926	18	63.7	15.3	19.3	-31.53
MT9508	19	63.9	15.6	17.9	-38.31
MTHW9520	21	62.7	14.8	19.9	*
MTHW9420	19	64.2	15.0	18.3	*
average	20.3	63.1	15.2	22.6	
p value	0.000	0.000	NS	0.000	
CV (S/Mean)	5.9	1.2	3.7	10.2	
CV(SE/Mean)	3.4	0.7	2.1	5.9	
LSD 0.05	2.0	1.2	--	3.8	

[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 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	# of years	1993	1994	1995	1996	1997	Ave	as % of McNeal
McNeal	5	61.5	50.9	38.1	24.7	25.8	40.2	100.0
AC Barrie	1	--	--	--	--	25.8	25.8	100.0
MT9433	1	--	--	--	--	25.5	25.5	98.8
2398	2	--	--	--	22.7	27.1	24.9	98.6
Keene	2	--	--	--	23.5	26.1	24.8	98.2
Amidon	5	55.1	52.5	37.2	25.8	26.5	39.4	98.1
2375	5	54.2	55.1	30.1	25.9	23.3	37.7	93.8
Grandin	5	59.4	46.2	33.8	21.9	23.1	36.9	91.7
Norlander	3	--	--	34.6	24.2	21.5	26.8	90.6
Lars	3	--	--	36.4	20.1	23.6	26.7	90.4
Newana	5	55.6	49.2	33.5	20.3	22.3	36.2	90.0
Express	3	--	--	36.9	20.7	21.8	26.5	89.6
Verde	1	--	--	--	--	23.0	23.0	89.1
Ernest	4	--	45.5	34.0	23.4	21.2	31.0	89.0
Len	1	--	--	--	--	22.6	22.6	87.6
Trenton	3	--	--	31.3	23.0	22.8	25.7	87.0
Westbred 936	3	--	--	31.8	23.4	21.7	25.6	86.8
Kulm	4	--	45.4	32.4	22.8	19.6	30.0	86.2
Lew	5	46.7	46.3	32.8	19.5	22.0	33.5	83.2
Hamer	3	--	--	28.0	22.1	22.6	24.2	82.1
MTHW9520	1	--	--	--	--	19.9	19.9	77.1
Westbred 926	3	--	--	25.5	20.5	19.3	21.8	73.7
MTHW9420	1	--	--	--	--	18.3	18.3	70.9
MT9508	1	--	--	--	--	17.9	17.9	69.4

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 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	# of years	1993	1994	1995	1996	1997	Ave	as % of McNeal
MTHW9420	1	--	--	--	--	64.2	64.2	105.6
Len	1	--	--	--	--	64.1	64.1	105.4
MT9508	1	--	--	--	--	63.9	63.9	105.1
Kulm	4	--	63.2	62.1	62.7	64.7	63.2	104.8
MT9433	1	--	--	--	--	62.8	62.8	103.3
MTHW9520	1	--	--	--	--	62.7	62.7	103.1
Verde	1	--	--	--	--	62.3	62.3	102.5
Ernest	4	--	63.4	59.0	61.3	63.3	61.8	102.4
Norlander	3	--	--	58.7	61.3	63.1	61.0	101.8
Lew	5	61.4	62.5	59.9	59.5	64.0	61.5	101.7
Keene	2	--	--	--	60.7	62.3	61.5	101.6
2375	5	60.7	62.4	59.0	60.8	63.3	61.2	101.4
Grandin	5	61.1	61.6	58.3	60.9	64.1	61.2	101.3
Hamer	3	--	--	58.6	60.3	63.3	60.7	101.3
Trenton	3	--	--	57.9	61.2	63.0	60.7	101.2
Express	3	--	--	58.0	60.8	62.8	60.5	100.9
AC Barrie	1	--	--	--	--	61.2	61.2	100.7
Amidon	5	60.7	62.0	58.5	60.3	62.0	60.7	100.5
Newana	5	59.1	60.9	58.5	60.3	64.7	60.7	100.5
2398	2	--	--	--	59.8	61.8	60.8	100.4
Westbred 936	3	--	--	55.9	60.2	64.1	60.1	100.2
McNeal	5	61.0	61.2	58.8	60.3	60.8	60.4	100.0
Westbred 926	3	--	--	56.3	59.3	63.7	59.8	99.7
Lars	3	--	--	57.8	56.4	62.1	58.8	98.0

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 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	# of years	1993	1994	1995	1996	1997	Ave	as % of McNeal
Kulm	4	--	12.5	15.1	14.2	16.1	14.48	102.5
Lew	5	14.0	11.9	14.9	14.8	15.0	14.12	100.9
Ernest	4	--	12.1	15.0	14.0	15.6	14.18	100.4
Grandin	5	13.7	11.7	15.1	14.1	15.5	14.02	100.1
McNeal	5	13.5	11.3	15.3	14.2	15.7	14.00	100.0
Trenton	3	--	--	15.4	14.3	15.4	15.03	99.8
Hamer	3	--	--	15.0	14.6	15.5	15.03	99.8
Westbred 926	3	--	--	14.6	15.1	15.3	15.00	99.6
MT9508	1	--	--	--	--	15.6	15.60	99.4
2398	2	--	--	--	15.2	14.5	14.85	99.3
Keene	2	--	--	--	14.5	15.2	14.85	99.3
Westbred 936	3	--	--	14.6	14.6	15.4	14.87	98.7
AC Barrie	1	--	--	--	--	15.5	15.50	98.7
Express	3	--	--	14.6	14.6	15.2	14.80	98.2
Norlander	3	--	--	14.3	14.1	15.8	14.73	97.8
2375	5	13.2	11.6	14.8	13.7	15.0	13.66	97.6
Amidon	5	14.2	11.4	14.5	13.4	14.6	13.62	97.3
MT9433	1	--	--	--	--	15.2	15.20	96.8
Lars	3	--	--	14.4	14.6	14.6	14.53	96.5
Len	1	--	--	--	--	15.0	15.00	95.5
MTHW9420	1	--	--	--	--	15.0	15.00	95.5
Verde	1	--	--	--	--	14.8	14.80	94.3
MTHW9520	1	--	--	--	--	14.8	14.80	94.3
Newana	5	12.0	11.2	14.1	13.5	14.8	13.12	93.7

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: 8 May 1997 Harvested: 2 September 1997 Cooperator: Max Aasheim

Variety	Height, inches	Test weight	Grain protein	Yield, bu/acre	$/acre[1] +/- McNeal
MT9433	25	61.0	14.6	33.6	7.22
2398	20	59.7	14.0	33.5	3.72
McNeal	24	60.0	13.8	33.2	0.00
Verde	22	60.7	13.6	33.0	-3.56
Lars	18	58.7	13.7	31.4	-8.28
AC Barrie	24	60.2	14.8	29.7	-9.86
Amidon	26	60.0	13.6	31.4	-10.79
Keene	23	61.0	14.4	30.0	-11.12
Len	22	60.0	14.4	29.3	-14.42
Trenton	25	61.2	14.2	29.4	-15.42
Kulm	21	61.7	14.8	28.2	-17.08
2375	21	60.0	13.2	29.4	-24.24
Grandin	23	61.6	14.7	26.8	-25.15
Ernest	25	61.4	14.2	26.4	-29.43
Hamer	20	60.0	13.5	27.1	-30.23
Lew	29	60.5	13.5	26.9	-31.13
Express	19	58.9	13.4	26.2	-36.39
Norlander	20	60.6	14.6	23.9	-38.96
Newana	22	61.7	13.4	25.5	-39.50
MT9508	21	61.9	14.4	22.0	-48.88
Westbred 936	18	59.0	14.2	20.3	-57.92
Westbred 926	19	61.4	14.2	20.0	-59.32
MTHW9520	23	59.7	13.6	32.3	*
MTHW9420	19	60.6	13.9	19.2	*
average	22.2	60.5	14.0	27.9	
p value	0.000	0.000	0.000	0.000	
CV (S/Mean)	5.6	1.1	1.6	8.2	
CV(SE/Mean)	3.2	0.7	0.9	4.7	
LSD 0.05	2.1	1.1	0.36	3.7	

[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 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	# of years	1993	1994	1995	1996	1997	Ave	as % of McNeal
MT9433	1	--	--	--	--	33.6	33.6	101.2
McNeal	5	31.7	58.2	29.9	45.8	33.2	39.8	100.0
Verde	1	--	--	--	--	33.0	33.0	99.4
MTHW9520	1	--	--	--	--	32.3	32.3	97.3
Sonja	3	--	61.0	29.2	38.5	--	42.9	96.1
Grandin	5	48.6	49.0	23.6	35.7	26.8	36.7	92.4
Amidon	5	27.8	54.0	28.5	39.2	31.4	36.2	91.0
Stoa	4	27.5	57.6	24.8	40.8	--	37.7	91.0
Keene	2	--	--	--	41.8	30.0	35.9	90.9
Lars	3	--	--	29.1	37.2	31.4	32.6	89.7
AC Barrie	1	--	--	--	--	29.7	29.7	89.5
2375	5	26.6	58.0	26.3	37.4	29.4	35.5	89.4
2398	2	--	--	--	36.6	33.5	35.0	88.7
Ernest	4	--	52.2	26.2	43.2	26.4	37.0	88.6
Len	1	--	--	--	--	29.3	29.3	88.3
Trenton	3	--	--	26.5	40.0	29.4	32.0	88.1
Newana	5	26.2	51.4	27.0	43.0	25.5	34.6	87.1
Hi-Line	4	18.7	51.8	27.7	43.6	--	34.5	85.6
Express	3	--	--	29.0	37.2	26.2	30.8	84.8
Lew	5	24.7	51.4	26.6	37.9	26.9	33.5	84.3
Hamer	3	--	--	25.6	38.3	27.1	30.3	83.6
Kulm	4	--	51.1	24.2	35.4	28.2	34.7	83.1
Norlander	3	--	--	29.0	34.1	23.9	29.0	79.9
Westbred 926	3	--	--	26.0	36.0	20.0	27.3	75.3
Westbred 936	3	--	--	22.8	32.3	20.3	25.1	69.2
MT9508	1	--	--	--	--	22.0	22.0	66.3
MTHW9420	1	--	--	--	--	19.2	19.2	57.8

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	# of years	1993	1994	1995	1996	1997	Ave	as % of McNeal
MT9508	1	--	--	--	--	61.9	61.9	103.2
Kulm	4	--	63.4	63.0	64.5	61.7	63.2	102.9
MT9433	1	--	--	--	--	61.0	61.0	101.7
Keene	2	--	--	--	64.0	61.0	62.5	101.6
Lew	5	62.7	60.0	63.1	64.2	60.5	62.1	101.3
Grandin	5	61.1	60.5	62.7	64.3	61.6	62.0	101.2
Verde	1	--	--	--	--	60.7	60.7	101.2
Ernest	4	--	62.2	60.7	63.8	61.4	62.0	101.1
Trenton	3	--	--	61.4	64.3	61.2	62.3	101.1
MTHW9420	1	--	--	--	--	60.6	60.6	101.0
2398	2	--	--	--	64.2	59.7	62.0	100.7
2375	5	61.2	61.8	60.6	64.0	60.0	61.5	100.4
Hi-Line	4	60.0	61.4	61.7	64.0	--	61.8	100.3
Newana	5	60.7	59.1	62.0	63.8	61.7	61.5	100.3
AC Barrie	1	--	--	--	--	60.2	60.2	100.3
Amidon	5	61.7	59.9	61.7	63.7	60.0	61.4	100.2
Norlander	3	--	--	60.6	63.8	60.6	61.7	100.1
McNeal	5	61.0	60.5	61.9	63.0	60.0	61.3	100.0
Len	1	--	--	--	--	60.0	60.0	100.0
Hamer	3	--	--	60.1	64.5	60.0	61.5	99.8
Express	3	--	--	61.9	63.7	58.9	61.5	99.8
Sonja	3	--	60.0	60.9	63.7	--	61.5	99.6
Westbred 926	3	--	--	59.7	63.0	61.4	61.4	99.6
MTHW9520	1	--	--	--	--	59.7	59.7	99.5
Stoa	4	60.4	60.0	61.3	63.2	--	61.2	99.4
Westbred 936	3	--	--	59.8	63.8	59.0	60.9	98.8
Lars	3	--	--	59.0	63.2	58.7	60.3	97.8

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	# of years	1993	1994	1995	1996	1997	Ave	as % of McNeal
AC Barrie	1	--	--	--	--	14.8	14.80	107.2
Hi-Line	4	14.6	12.7	11.2	14.3	--	13.20	105.8
MT9433	1	--	--	--	--	14.6	14.60	105.8
Kulm	4	--	13.5	10.8	14.1	14.8	13.30	104.5
Len	1	--	--	--	--	14.4	14.40	104.3
MT9508	1	--	--	--	--	14.4	14.40	104.3
Ernest	4	--	13.9	10.4	14.4	14.2	13.23	103.9
Amidon	5	14.0	14.0	10.0	14.0	13.6	13.12	103.0
Sonja	3	--	14.2	10.4	13.6	--	12.73	103.0
Stoa	4	13.6	14.2	10.0	13.4	--	12.80	102.6
Westbred 936	3	--	--	10.8	14.1	14.2	13.03	102.6
Westbred 926	3	--	--	11.0	13.8	14.2	13.00	102.4
Lew	5	14.0	13.9	10.3	13.3	13.5	13.00	102.0
Grandin	5	13.7	12.2	10.3	14.0	14.7	12.98	101.9
Norlander	3	--	--	9.8	14.4	14.6	12.93	101.8
2398	2	--	--	--	14.1	14.0	14.05	101.4
MTHW9420	1	--	--	--	--	13.9	13.90	100.7
Keene	2	--	--	--	13.4	14.4	13.90	100.4
McNeal	5	12.8	12.8	10.4	13.9	13.8	12.74	100.0
Trenton	3	--	--	10.1	13.5	14.2	12.60	99.2
2375	5	13.0	12.4	10.2	14.2	13.2	12.60	98.9
Hamer	3	--	--	10.3	13.8	13.5	12.53	98.7
Verde	1	--	--	--	--	13.6	13.60	98.6
MTHW9520	1	--	--	--	--	13.6	13.60	98.6
Express	3	--	--	10.4	13.6	13.4	12.47	98.2
Newana	5	12.4	12.8	9.8	13.0	13.4	12.28	96.4
Lars	3	--	--	9.8	13.1	13.7	12.20	96.1

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: 5 May 1997, Harvested: 4 September 1997 Cooperator: Bill Lauckner

Variety	Height, inches	Test weight	Grain protein	Yield, bu/acre	$/acre[1] +/- McNeal
Grandin	23	59.3	15.3	39.4	4.37
McNeal	20	58.2	16.4	38.5	0.00
Amidon	22	58.3	14.6	38.7	-2.51
MT9433	21	59.0	16.4	36.8	-8.24
2398	18	58.2	15.8	35.8	-13.09
Trenton	21	59.5	15.2	34.4	-19.88
Newana	19	59.3	14.8	34.3	-21.74
Keene	22	59.0	16.1	34.0	-21.82
AC Barrie	21	58.8	16.0	32.3	-30.06
Norlander	21	57.7	15.8	32.3	-30.06
Len	21	58.5	15.7	31.8	-32.49
Lew	23	59.3	14.4	32.3	-34.26
Lars	17	58.0	14.8	31.4	-35.69
Kulm	22	60.0	16.9	31.1	-35.88
Westbred 936	19	58.5	16.0	31.1	-35.88
Hamer	18	58.8	15.5	29.0	-46.07
Tioga	23	58.2	16.0	28.7	-47.52
Ernest	21	58.3	15.5	28.3	-49.46
2375	20	58.8	15.8	28.0	-50.92
Westbred 926	20	59.0	16.1	27.5	-53.34
MT9508	21	58.3	16.2	26.6	-57.71
Verde	20	58.7	14.9	25.9	-62.14
Express	18	58.2	16.2	25.3	-64.02
MTHW9520	20	59.0	15.4	33.5	*
MTWH9420	18	58.5	15.5	30.9	*
average	20.4	58.7	15.6	31.9	
p value	0.000	0.000	0.000	0.000	
CV (S/Mean)	7.6	0.4	2.1	10.5	
CV(SE/Mean)	4.4	0.2	1.2	6.1	
LSD 0.05	2.5	0.4	0.54	5.5	

[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	# of years	1993	1994	1995	1996	1997	Ave	as % of McNeal
Westbred 936	3	--	--	48.1	38.7	31.1	39.3	100.9
McNeal	5	58.7	60.0	44.0	34.4	38.5	47.1	100.0
2398	2	--	--	--	36.5	35.8	36.2	99.2
Sonja	4	--	60.6	38.4	36.7	--	45.2	98.0
Norlander	3	--	--	47.1	32.6	32.3	37.3	95.8
MT9433	1	--	--	--	--	36.8	36.8	95.6
Keene	2	--	--	--	35.1	34.0	34.6	94.8
Lars	3	--	--	45.3	33.6	31.4	36.8	94.4
Express	3	--	--	47.1	37.5	25.3	36.6	94.0
Amidon	5	45.1	51.4	43.7	33.8	38.7	42.5	90.3
Hamer	3	--	--	40.3	33.5	29.0	34.3	87.9
Grandin	5	45.3	45.9	42.4	32.9	39.4	41.2	87.4
Trenton	3	--	--	32.9	34.5	34.4	33.9	87.1
MTHW9520	1	--	--	--	--	33.5	33.5	87.0
Kulm	4	-	52.8	38.3	31.5	31.1	38.4	86.9
Ernest	4	--	52.8	37.4	31.0	28.3	37.4	84.5
Newana	5	35.0	61.3	30.7	37.0	34.3	39.7	84.2
Tioga	4	--	53.1	36.4	30.7	28.7	37.2	84.2
Stoa	4	38.3	56.0	40.6	30.6	--	41.4	84.0
AC Barrie	1	--	--	--	--	32.3	32.3	83.9
Len	1	--	--	--	--	31.8	31.8	82.6
2375	5	42.8	52.4	31.4	37.4	28.0	38.4	81.5
MTHW9420	1	--	--	--	--	30.9	30.9	80.3
Lew	5	36.4	54.8	32.0	31.9	32.3	37.5	79.5
Hi-Line	4	36.3	48.0	39.3	32.0	--	38.9	78.9
Westbred 926	3	--	--	35.7	36.2	27.5	33.1	74.9
MT9508	1	--	--	--	--	26.6	26.6	69.1
Verde	1	--	--	--	--	25.9	25.9	67.3

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 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	# of years	1993	1994	1995	1996	1997	Ave	as % of McNeal
Kulm	4	--	63.8	61.2	62.8	60.0	62.0	104.8
Ernest	4	--	63.2	59.9	62.2	58.3	60.9	103.0
Keene	2	--	--	--	63.0	59.0	61.0	103.0
Lew	5	58.7	61.9	60.8	61.8	59.3	60.5	102.3
Amidon	5	58.5	62.1	60.8	61.3	58.3	60.2	101.8
Tioga	4	--	61.5	59.0	61.8	58.2	60.1	101.7
Grandin	5	60.0	60.2	58.6	61.7	59.3	60.0	101.6
Trenton	3	--	--	59.9	61.2	59.5	60.2	101.4
MT9433	1	--	--	--	--	59.0	59.0	101.4
MTHW9520	1	--	--	--	--	59.0	59.0	101.4
Express	3	--	--	59.4	62.2	58.2	59.9	101.0
2398	2	--	--	--	61.5	58.2	59.8	101.0
AC Barrie	1	--	--	--	--	58.8	58.8	101.0
2375	5	57.7	60.6	60.0	61.5	58.8	59.7	100.9
Verde	1	--	--	--	--	58.7	58.7	100.9
Hamer	3	--	--	58.4	62.2	58.8	59.8	100.7
Westbred 936	3	--	--	58.6	62.0	58.5	59.7	100.6
Westbred 926	3	--	--	58.1	62.0	59.0	59.7	100.6
Len	1	--	--	--	--	58.5	58.5	100.5
MTHW9420	1	--	--	--	--	58.5	58.5	100.5
Newana	5	56.8	59.6	58.6	62.0	59.3	59.3	100.2
MT9508	1	--	--	--	--	58.3	58.3	100.2
McNeal	5	59.4	58.3	59.6	60.3	58.2	59.2	100.0
Norlander	3	-	--	58.1	62.3	57.7	59.4	100.0
Sonja	3	--	58.9	58.2	60.7	--	59.3	99.8
Hi-Line	4	57.1	58.4	59.0	61.8	--	59.1	99.5
Stoa	4	56.5	59.7	58.8	61.2	--	59.0	99.4
Lars	3	--	--	57.4	61.2	58.0	58.9	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 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	# of years	1993	1994	1995	1996	1997	Ave	as % of McNeal
Stoa	4	16.4	14.9	15.1	13.7	--	15.03	101.0
Kulm	4	--	14.5	14.5	14.7	16.9	15.15	100.2
McNeal	5	15.4	15.0	14.8	14.3	16.4	15.18	100.0
MT9433	1	--	--	--	--	16.4	16.40	100.0
2398	2	--	--	--	14.6	15.8	15.20	99.0
Grandin	5	15.8	14.8	14.5	14.7	15.3	15.02	98.9
MT9508	1	--	--	--	--	16.2	16.20	98.8
Westbred 936	3	-	--	14.8	14.0	16.0	14.93	98.5
Ernest	4	--	14.7	14.8	14.3	15.5	14.83	98.0
Hi-Line	4	14.5	15.6	14.6	13.6	--	14.58	98.0
Trenton	3	--	--	14.8	14.6	15.2	14.87	98.0
Express	3	--	--	14.1	14.3	16.2	14.87	98.0
Tioga	4	--	14.2	15.6	13.3	16.0	14.78	97.7
AC Barrie	1	--	--	--	--	16.0	16.00	97.6
Westbred 926	3	--	--	14.7	13.3	16.1	14.70	96.9
Sonja	3	--	14.0	14.6	14.0	--	14.20	96.6
Norlander	3	--	--	13.9	13.9	15.8	14.53	95.8
Len	1	--	--	--	--	15.7	15.70	95.7
2375	5	14.6	13.7	14.5	13.6	15.8	14.44	95.1
Amidon	5	15.3	14.2	14.2	13.8	14.6	14.42	95.0
Hamer	3	--	--	13.7	13.8	15.5	14.33	94.5
MTHW9420	1	--	--	--	--	15.5	15.50	94.5
Lew	5	15.4	13.8	15.0	13.0	14.4	14.32	94.3
Keene	2	--	--	--	12.8	16.1	14.45	94.1
MTHW9520	1	--	--	--	--	15.4	15.40	93.9
Newana	5	14.9	13.9	14.2	12.7	14.8	14.10	92.9
Lars	3	--	--	14.2	12.8	14.8	13.93	91.9
Verde	1	--	--	--	--	14.9	14.90	90.9

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 irrigated conditions at Scobey, MT.
Planted: 7 May 1997 Harvested: 5 September 1997 Cooperator: Kenny Benson

Variety	Height, inches	Test weight	Grain protein	Yield, bu/acre	$/acre[1] +/- McNeal
Ernest	36	60.8	14.0	56.2	21.87
Trenton	38	60.8	14.1	54.2	12.53
2398	29	60.2	13.5	54.9	7.57
MT9433	33	61.2	13.9	53.4	5.06
McNeal	33	60.2	13.8	52.3	0.00
Keene	36	61.7	13.8	52.3	0.00
AC Barrie	35	58.8	14.4	49.3	-7.88
Verde	30	59.0	12.8	54.0	-8.38
Amidon	38	61.0	13.8	49.9	-11.04
2375	35	59.3	13.2	49.3	-25.14
Express	26	58.2	13.7	47.5	-25.88
Len	29	59.2	13.9	45.3	-32.20
Grandin	32	61.0	13.9	45.0	-33.58
Norlander	29	58.3	13.8	44.7	-34.96
Kulm	33	61.0	14.1	42.7	-41.17
Hamer	29	59.3	13.0	42.6	-54.42
Lars	26	56.2	13.4	41.5	-56.32
Lew	37	60.5	13.3	40.3	-61.65
Westbred 926	28	57.8	14.1	36.4	-70.59
Westbred 936	25	56.8	13.6	35.6	-79.67
MT9508	29	60.3	13.3	35.6	-82.52
Newana	27	57.3	13.2	32.2	-99.87
Penewawa	28	56.8	11.8	45.8	*
MTHW9520	30	57.3	13.2	44.7	**
MTHW9420	27	57.8	13.4	34.8	**
average	31.1	59.2	13.6	45.6	
p value	0.000	0.000	0.000	0.000	
CV (S/Mean)	7.0	0.9	2.4	9.7	
CV(SE/Mean)	4.0	0.5	1.4	5.6	
LSD 0.05	3.6	0.9	0.5	7.3	

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

Table 26. Relative yielding abilities of spring wheat varieties as compared to McNeal when grown under irrigated conditions in Daniels County in cooperation with CES.
Cooperator: Kenny Benson

Variety	# of years	1996	1997	average	As % of McNeal
2398	2	74.6	54.9	64.8	107.3
Verde	1	--	54.0	54.0	103.3
MT9433	1	--	53.4	53.4	102.1
Amidon	2	72.1	49.9	61.0	101.0
McNeal	2	68.6	52.3	60.4	100.0
Ernest	2	61.2	56.2	58.7	97.2
AC Barrie	1	--	49.3	49.3	94.3
2375	2	63.9	49.3	56.6	93.7
Lars	2	69.7	41.5	55.6	92.1
Keene	2	58.5	52.3	55.4	91.7
Express	2	63.2	47.5	55.4	91.7
Norlander	2	65.7	44.7	55.2	91.4
Trenton	2	54.4	54.2	54.3	89.9
Grandin	2	62.9	45.0	54.0	89.4
Hamer	2	64.3	42.6	53.4	88.4
Penewawa	1	--	45.8	45.8	87.6
Len	1	--	45.3	45.3	86.6
MTHW9520	1	--	44.7	44.7	85.5
Lew	2	61.8	40.3	51.0	84.4
Kulm	2	56.7	42.7	49.7	82.3
Westbred 936	2	61.3	35.6	48.4	80.1
Newana	2	64.2	32.2	48.2	79.8
Westbred 926	2	52.2	36.4	44.3	73.3
MT9508	1	--	35.6	35.6	68.1
MTHW9420	1	--	34.8	34.8	66.5

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.

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

Variety	# of years	1996	1997	average	As % of McNeal
Keene	2	64.5	61.7	63.1	102.3
MT9433	1	--	61.2	61.2	101.7
Ernest	2	64.3	60.8	62.6	101.5
Kulm	2	64.0	61.0	62.5	101.3
Grandin	2	64.0	61.0	62.5	101.3
Trenton	2	64.0	60.8	62.4	101.1
Amidon	2	63.8	61.0	62.4	101.1
Lew	2	64.3	60.5	62.4	101.1
2398	2	64.0	60.2	62.1	100.6
MT9508	1	--	60.3	60.3	100.2
McNeal	2	63.2	60.2	61.7	100.0
2375	2	63.7	59.3	61.5	99.7
Hamer	2	63.5	59.3	61.4	99.5
Len	1	--	59.2	59.2	98.3
Norlander	2	63.0	58.3	60.6	98.2
Express	2	63.0	58.2	60.6	98.2
Verde	1	--	59.0	59.0	98.0
Newana	2	63.5	57.3	60.4	97.9
AC Barrie	1	--	58.8	58.8	97.7
Westbred 926	2	62.3	57.8	60.0	97.2
Westbred 936	2	62.0	56.8	59.4	96.3
MTHW9420	1	--	57.8	57.8	96.0
Lars	2	62.2	56.2	59.2	95.9
MTHW9520	1	--	57.3	57.3	95.2
Penewawa	1	--	56.8	56.8	94.4

NOTE: Average test weights 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.

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

Variety	# of years	1996	1997	average	As % of McNeal
Kulm	2	14.9	14.1	14.50	105.1
AC Barrie	1	--	14.3	14.30	103.6
Trenton	2	14.4	14.1	14.25	103.3
Keene	2	14.4	13.8	14.10	102.2
Grandin	2	14.2	13.9	14.05	101.8
Ernest	2	14.1	14.0	14.05	101.8
Westbred 926	2	13.7	14.1	13.90	100.7
MT9433	1	--	13.9	13.90	100.7
Len	1	--	13.9	13.90	100.7
Norlander	2	13.9	13.8	13.85	100.4
McNeal	2	13.8	13.8	13.80	100.0
Westbred 936	2	13.9	13.6	13.75	99.6
Express	2	13.8	13.7	13.75	99.6
Amidon	2	13.6	13.8	13.70	99.3
Lew	2	13.9	13.3	13.60	98.6
2398	2	13.4	13.5	13.45	97.5
MTHW9420	1	--	13.4	13.40	97.1
2375	2	13.5	13.2	13.35	96.7
MTHW9520	1	--	13.2	13.20	95.7
Hamer	2	13.0	13.0	13.00	94.2
MT9508	1	--	13.0	13.00	94.2
Newana	2	12.7	13.2	12.95	93.8
Lars	2	12.4	13.4	12.90	93.5
Verde	1	--	12.8	12.80	92.8
Penewawa	1	--	11.8	11.80	85.5

NOTE: Average proteins 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.

Table 29. Performance of spring wheat grown under irrigated conditions at Larslan, MT.
Planted: 6 May 1997, Harvested: 4 September 1997 Cooperator: Kelly Donovan

Variety	Height, inches	Test weight	Grain protein	Yield, bu/acre	$/acre[1] +/- McNeal
Kulm	37	62.0	13.8	106.3	31.28
Grandin	35	60.2	13.7	103.5	10.12
Verde	33	58.8	13.0	106.7	8.58
Keene	39	62.7	13.8	100.1	2.76
2375	34	62.0	12.8	106.7	1.11
McNeal	33	60.3	13.8	99.5	0.00
Express	28	58.0	13.6	100.2	-4.80
2398	31	60.0	13.2	103.5	-5.40
Ernest	38	61.2	13.7	99.2	-9.32
Trenton	38	60.3	13.9	97.0	-11.50
Hamer	31	60.3	12.9	102.5	-16.95
AC Barrie	38	61.8	14.5	92.4	-17.88
Lars	30	59.5	12.6	101.9	-27.68
MT9433	35	59.2	14.9	87.5	-36.82
Len	33	58.7	14.0	88.9	-42.54
Newana	32	59.7	13.0	94.9	-42.99
Amidon	36	60.3	13.2	94.3	-45.61
Norlander	30	58.3	13.2	90.0	-64.40
Westbred 926	30	59.0	13.2	87.4	-75.76
Westbred 936	28	55.3	14.2	81.2	-78.50
MT9508	33	60.7	13.8	78.6	-96.14
NK 751	26	56.8	12.6	82.0	-111.66
Lew	40	59.7	14.8	66.8	-136.39
MTHW9420	29	58.7	12.9	100.6	*
MTHW9520	33	57.3	14.1	91.2	*
average	33.2	59.6	13.6	94.5	
p value	0.000	0.000	0.000	0.000	
CV (S/Mean)	4.4	1.5	3.7	9.1	
CV(SE/Mean)	2.6	0.9	2.2	5.2	
LSD 0.05	2.4	1.5	0.83	14.1	

[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 30. Relative yields of spring wheat varieties as compared to McNeal when grown under irrigated conditions in Valley County in cooperation with CES.
Cooperator: Kelly Donovan

Cultivar	# of years	1993	1994	1995	1996	1997	Ave	as % of McNeal
Express	3	--	--	58.2	79.8	100.2	79.4	112.9
Hamer	3	--	--	53.5	73.4	102.5	76.5	108.8
2375	5	71.8	74.0	66.9	76.7	106.7	79.2	108.5
Verde	1	--	--	--	--	106.7	106.7	107.2
Sonja	5	81.8	85.9	39.2	76.9	--	71.0	106.9
2398	2	--	--	--	75.0	103.5	89.2	104.6
Keene	2	--	--	--	75.8	100.1	88.0	103.1
Lars	3	--	--	45.2	68.9	101.9	72.0	102.4
MTHW9420	1	--	--	--	--	100.6	100.6	101.1
McNeal	5	64.3	89.9	40.3	71.1	99.5	73.0	100.0
Norlander	3	--	--	44.6	75.3	90.0	70.0	99.5
Trenton	3	--	--	37.4	70.9	97.0	68.4	97.3
Grandin	5	68.9	73.3	40.0	64.0	103.5	69.9	95.8
Westbred 926	3	--	--	40.2	71.8	87.4	66.5	94.5
Westbred 936	3	--	--	45.6	70.8	81.2	65.9	93.7
Hi-Line	4	61.4	81.3	36.6	68.4	--	61.9	93.3
Kulm	4	--	66.3	38.6	69.2	106.3	70.1	93.2
AC Barrie	1	--	--	--	--	92.4	92.4	92.9
MTHW9520	1	--	--	--	--	91.2	91.2	91.7
Newana	5	59.0	80.7	34.1	64.9	94.9	66.7	91.4
Amidon	5	61.8	74.4	33.0	68.4	94.3	66.4	90.9
Len	1	--	--	--	--	88.9	88.9	89.3
Ernest	4	--	61.1	40.2	65.5	99.2	66.5	88.4
Stoa	3	--	78.2	35.5	64.1	--	59.3	88.3
MT9433	1	--	--	--	--	87.5	87.5	87.9
NK 751	2	--	77.6	--	--	82.0	79.8	84.3
Lew	4	--	75.5	39.8	57.0	66.8	59.8	79.5
MT9508	1	--	--	--	--	78.6	78.6	79.0

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.
Cooperator: Kelly Donovan

Cultivar	# of years	1993	1994	1995	1996	1997	Ave	as % of McNeal
Keene	2	--	--	--	61.7	62.7	62.2	105.8
Kulm	4	--	63.7	60.1	62.7	62.0	62.1	104.7
2375	5	61.7	64.8	60.5	61.0	62.0	62.0	104.1
Ernest	4	--	64.1	58.7	62.2	61.2	61.6	103.7
Lew	4	--	64.9	61.0	59.3	59.7	61.2	103.2
Hamer	3	--	--	59.5	59.8	60.3	59.9	103.0
AC Barrie	1	--	--	--	--	61.8	61.8	102.5
Trenton	3	--	--	57.7	60.5	60.3	59.5	102.4
Stoa	3	--	64.9	56.8	59.7	--	60.5	102.3
Amidon	5	61.0	63.3	58.6	61.0	60.3	60.8	102.1
2398	2	--	--	--	59.8	60.0	59.9	101.9
Norlander	3	--	--	58.2	60.8	58.3	59.1	101.7
Grandin	5	61.4	63.8	58.6	58.3	60.2	60.5	101.5
Express	3	--	--	59.9	59.0	58.0	59.0	101.4
Hi-Line	4	60.6	64.4	57.0	58.5	--	60.1	101.3
Sonja	4	62.0	63.9	57.7	56.5	--	60.0	101.1
MT9508	1	--	--	--	--	60.7	60.7	100.7
McNeal	5	60.2	63.2	56.8	57.3	60.3	59.6	100.0
Newana	5	59.5	63.6	57.0	58.2	59.7	59.6	100.0
Lars	3	--	--	56.6	56.8	59.5	57.6	99.1
MT9433	1	--	--	--	--	59.2	59.2	98.2
Westbred 926	3	--	--	54.2	57.3	59.0	56.8	97.8
Verde	1	--	--	--	--	58.8	58.8	97.5
MTHW9420	1	--	--	--	--	58.7	58.7	97.3
Len	1	--	--	--	--	58.7	58.7	97.3
NK 751	2	--	62.7	--	--	56.8	59.8	96.8
Westbred 936	3	--	--	54.9	57.3	55.3	55.8	96.0
MTHW9520	1	--	--	--	--	57.3	57.3	95.0

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

Cultivar	# of years	1993	1994	1995	1996	1997	Ave	as % of McNeal
MT9433	1	--	--	--	--	14.9	14.90	108.0
Kulm	4	--	17.7	16.2	15.0	13.8	15.68	106.6
AC Barrie	1	--	--	--	--	14.5	14.50	105.1
Ernest	4	--	17.2	15.7	14.6	13.7	15.30	104.1
Westbred 936	3	--	--	16.1	14.8	14.2	15.03	103.4
Stoa	3	--	15.9	15.8	14.5	--	15.40	102.7
MTHW9520	1	--	--	--	--	14.1	14.10	102.2
Lew	4	--	14.5	15.8	14.8	14.8	14.98	101.9
Trenton	3	--	--	15.8	14.5	13.9	14.73	101.4
Len	1	--	--	--	--	14.0	14.00	101.4
McNeal	5	14.4	15.2	15.4	14.4	13.8	14.64	100.0
MT9508	1	--	--	--	--	13.8	13.80	100.0
Hi-Line	4	14.8	14.7	15.3	14.4	--	14.80	99.7
Grandin	5	14.6	15.1	14.8	14.6	13.7	14.56	99.5
Sonja	4	13.8	15.3	15.2	14.8	--	14.78	99.5
Westbred 926	3	--	--	15.5	14.4	13.2	14.37	98.9
Keene	2	--	--	--	13.8	13.8	13.80	97.9
Amidon	5	13.9	15.3	15.3	13.8	13.2	14.30	97.7
2398	2	--	--	--	14.2	13.2	13.70	97.2
2375	5	13.6	15.3	15.2	14.2	12.8	14.22	97.1
Norlander	3	--	--	15.3	13.7	13.2	14.07	96.8
Express	3	--	--	14.5	14.0	13.6	14.03	96.6
Hamer	3	--	--	14.7	14.0	12.9	13.87	95.4
Lars	3	--	--	14.8	14.0	12.6	13.80	95.0
Newana	5	13.2	14.2	15.0	14.1	13.0	13.90	94.9
Verde	1	--	--	--	--	13.0	13.00	94.2
MTHW9420	1	--	--	--	--	12.9	12.90	93.5
NK 751	2	--	13.6	--	--	12.6	13.10	90.3

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.