PROJECT TITLE: Evaluation of spring wheat and durum variety performance in off-station trials in five counties in eastern Montana.

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OBJECTIVE:

To evaluate new varieties of spring wheat and durum in different environments in eastern Montana, and to compare experimental lines and new varieties with varieties currently being grown.

RESULTS, SPRING WHEAT :

Twenty-four spring wheat varieties were tested at five dryland and two irrigated sites. The irrigated site at Dagmar was not harvested because of severe weed infestation. Yields, test weights, and protein contents across the sites are shown in Tables 1, 2, and 3.

McCone County, Circle, dryland, cooperator: Victor Wagner

The experimental site was fallow in 1994. Plots were planted on 21 April and harvested on 18 August. Amidon, Stoa, and McNeal yielded most at this site. The average yield was 26.2 bu/acre. Five year summaries for yield, test weight, and protein are shown in Tables 4 through 6.

Wibaux County, Wibaux, dryland, cooperator: David Maus

The experimental site was fallow in 1994. Plots were planted on 24 April and harvested on 29 August. Stoa, McNeal, and Sonja yielded most at this site. The average yield was 26.9 bu/acre. Five year summaries for yield, test weight, and protein are shown in Tables 7 through 9.

Roosevelt County, Poplar, dryland, cooperator: Mark Swank

The experimental site was fallow in 1994. Plots were planted on 15 May and harvested on 24 August. McNeal, Amidon, and Express yielded most at this site. The average yield was 32.2 bu/acre. Five year summaries for yield, test weight, and protein are shown in Tables 10 through 12.

Sheridan County, Reserve, dryland, cooperator: Max Aasheim

The experimental site was fallow in 1994. Plots were planted on 16 May and harvested on 24 August. Krona, McNeal, and Sonja yielded most at this site. The average yield was 26.9 bu/acre. Five year summaries for yield, test weight, and protein are shown in Tables 13 through 15.

Valley County, Nashua, dryland, cooperator: Bill Lauckner

The experimental site was fallow in 1994. Plots were planted on 11 May and harvested on 24 August. Westbred 936, Norlander, and Express yielded most at this site. The average yield was 39.8 bu/acre. Five year summaries for yield, test weight, and protein are shown in Tables 16 through 18.

Valley County, Larslan, irrigated, cooperator: Kelly Donovan

The experimental site was located under a pivot irrigation system. Plots were planted in 11 May and harvested on 24 August. Pioneer 2375, Express, and Westbred 936 yielded most at this site. The average yield was 40.3 bu/acre. Five year summaries for yield, test weight, and protein are shown in Tables 19 through 21.

RESULTS, DURUM:

Ten durum varieties were tested at two dryland and one irrigated sites. The irrigated site at Dagmar was not harvested because of severe weed infestation. Yields, test weights, and protein contents across the sites are shown in Table 22.

Roosevelt County, Poplar, dryland, cooperator: Mark Swank

The experimental site was fallow in 1994. Plots were planted on 15 May and harvested on 24 August. Kyle and Munich yielded most at this site. The average yield was 40.0 bu/acre. Five year summaries for yield, test weight, and protein are shown in Tables 23 through 25.

Sheridan County, Reserve, dryland, cooperator: Max Aasheim

The experimental site was fallow in 1994. Plots were planted on 16 May and harvested on 24 August. Kyle and Vic yielded most at this site. The average yield was 28.8 bu/acre. Five year summaries for yield, test weight, and protein are shown in Tables 26 through 28.

SUMMARY:

The experiments reported under this project are all of the replicated small plot type conducted under dryland and irrigated conditions. Both irrigated sites are under pivots. The County agents plant and harvest, or help plant and harvest the plots in their own and surrounding counties. Soil moisture and rainfall were generally adequate in eastern Montana this year, so that yields were about normal. Shattering due to high winds at maturity occurred at some sites, resulting in shatter resistant varieties performing better than shatter susceptible varieties.

FUTURE PLANS: New varieties will continue to be evaluated and compared with existing varieties at these off-station sites. A third irrigated site in Daniels County to test spring wheat and durum will be included in 1996. 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 at five dryland and one irrigated off-station sites in Montana.

	dryland						irrigated
Variety	Circle	Wibaux	Poplar	Reserve	Nashua	dryland average	Larslan
Krona	28.8	30.7	36.9	34.2	45.3	35.2	43.2
McNeal	29.4	32.8	38.1	29.9	44.0	34.8	40.3
Amidon	32.6	28.6	37.2	28.5	43.7	34.1	33.0
Lars	26.1	32.2	36.4	29.1	45.3	33.8	45.2
Norlander	25.5	29.8	34.6	29.0	47.1	33.2	44.6
Stoa	30.5	33.7	34.1	24.8	40.6	32.7	35.5
Pondera	27.8	25.0	33.3	28.6	39.6	30.9	32.0
Westbred 936	27.9	23.5	31.8	22.8	48.1	30.8	45.6
Ernest	28.6	27.8	34.0	26.2	37.4	30.8	40.2
Express	21.7	17.7	36.9	29.0	47.1	30.5	58.2
Kulm	23.6	31.0	32.4	24.2	38.3	29.9	38.6
Grandin	25.0	24.1	33.8	23.6	42.4	29.8	40.0
Sonja	26.5	32.3	22.6	29.2	38.4	29.8	39.2
Trenton	25.7	30.8	31.3	26.5	32.9	29.4	37.4
Lew	28.5	26.1	32.8	26.6	32.0	29.2	39.8
Rambo	27.9	26.9	28.2	26.4	35.5	29.0	43.7
Border	17.8	26.6	29.6	24.6	45.8	28.9	31.8
MT 9406	26.5	29.7	25.1	23.0	40.4	28.9	33.2
Newana	26.8	25.8	33.5	27.0	30.7	28.8	34.1
Pioneer 2375	28.6	27.2	30.1	26.3	31.4	28.7	66.9
Hamer	25.9	22.6	28.0	25.6	40.3	28.5	53.5
Hi-Line	22.5	17.5	33.7	27.7	39.3	28.1	36.6
Fergus	21.4	23.1	32.0	26.0	37.6	28.0	37.2
Westbred 926	24.5	20.7	25.5	26.0	35.7	26.5	40.2
Tioga	--	--	--	--	36.4	--	--
site average	26.2	26.9	32.2	26.9	39.8		40.3
p value	0.000	0.000	0.000	0.002	0.014		0.000
CV (S/Mean)	11.34	15.5	8.26	10.2	15.5		15.1
CV(SE/Mean)	6.55	8.94	4.77	5.87	8.95		8.72
LSD 0.05	4.9	6.9	4.4	4.5	10.1		10.2
Planting date	21 Apr	24 Apr	15 May	16 May	11 May		11 May
Harvest date	18 Aug	29 Aug	24 Aug	24 Aug	24 Aug		24 Aug

Table 2. Summary of spring wheat test weights at five dryland and one irrigated off-station sites in Montana.

	dryland						irrigated
Variety	Circle	Wibaux	Poplar	Reserve	Nashua	dryland average	Larslan
Kulm	64.0	63.2	62.1	63.0	61.2	62.7	60.1
Lew	63.8	62.2	59.9	63.1	60.8	62.0	61.0
Pondera	64.4	62.9	59.4	62.1	59.6	61.7	57.3
Amidon	63.8	62.1	58.5	61.7	60.8	61.4	58.6
Grandin	64.5	62.7	58.3	62.7	58.6	61.4	58.6
Rambo	63.7	62.2	59.2	61.2	60.2	61.3	59.2
Trenton	64.3	62.9	57.9	61.4	59.9	61.3	57.7
Fergus	64.3	63.1	57.6	61.8	59.7	61.3	54.8
Border	63.7	62.6	58.3	61.6	60.5	61.3	55.7
Newana	64.1	62.6	58.5	62.0	58.6	61.2	57.0
McNeal	63.3	61.6	58.8	61.9	59.6	61.0	56.8
Pioneer 2375	63.8	61.8	59.0	60.6	60.0	61.0	60.5
Ernest	63.2	61.4	59.0	60.7	59.9	60.8	58.7
Norlander	63.3	61.8	58.7	60.6	58.1	60.5	58.2
Express	62.4	60.7	58.0	61.9	59.4	60.5	59.9
Hamer	63.4	61.7	58.6	60.1	58.4	60.4	59.5
Stoa	62.9	61.6	57.2	61.3	58.8	60.4	56.8
Hi-Line	62.5	60.8	57.3	61.7	59.0	60.3	57.0
Sonja	62.8	61.9	56.6	60.9	58.2	60.1	57.7
Krona	63.3	61.9	58.1	60.9	56.4	60.1	56.9
Westbred 926	63.2	61.7	56.3	59.7	58.1	59.8	54.1
Lars	62.4	61.4	57.8	59.0	57.4	59.6	56.6
Westbred 936	62.7	61.0	55.9	59.8	58.6	59.6	54.9
MT 9406	62.4	61.2	55.1	58.9	57.8	59.1	53.5
Tioga	--	--	--	--	59.0	--	
site average	63.4	62.0	58.2	61.2	59.2		57.5
p value	0.000	0.000	0.000	0.000	0.000		0.000
CV (S/Mean)	0.65	0.89	1.36	0.70	1.24		2.65
CV(SE/Mean)	0.37	0.51	0.79	0.40	0.72		1.53
LSD 0.05	0.67	0.90	1.30	0.70	1.21		2.51

Table 3. Summary of spring wheat protein contents at five dryland and one irrigated off-station sites in Montana.

	dryland						irrigated
Variety	Circle	Wibaux	Poplar	Reserve	Nashua	dryland average	Larslan
Fergus	14.6	12.9	14.4	10.9	14.7	13.5	16.0
Hi-Line	13.8	13.0	15.1	11.2	14.6	13.5	15.3
Westbred 926	13.8	13.4	14.6	11.0	14.7	13.5	15.5
Kulm	14.0	12.4	15.1	10.8	14.5	13.4	16.2
Ernest	14.0	13.0	15.0	10.4	14.8	13.4	15.7
McNeal	13.8	12.1	15.3	10.4	14.8	13.3	15.4
Westbred 936	13.4	13.1	14.6	10.8	14.8	13.3	16.1
Lew	12.9	13.1	14.9	10.3	15.0	13.2	15.8
Pondera	13.2	13.6	14.3	10.4	14.5	13.2	15.4
Express	14.6	12.1	14.6	10.4	14.1	13.2	14.5
Grandin	13.3	12.5	15.1	10.3	14.5	13.1	14.8
Trenton	13.5	11.8	15.4	10.1	14.8	13.1	15.8
Hamer	14.2	12.1	15.0	10.3	13.7	13.1	14.7
Stoa	13.4	11.9	15.3	10.0	15.1	13.1	15.8
Border	13.6	12.3	14.2	11.0	13.7	13.0	14.7
Sonja	13.2	11.9	14.9	10.4	14.6	13.0	15.2
MT 9406	13.0	12.2	14.6	11.1	14.0	13.0	15.8
Amidon	12.8	12.8	14.5	10.0	14.2	12.9	15.3
Pioneer 2375	12.7	12.2	14.8	10.2	14.5	12.9	15.2
Norlander	14.2	12.1	14.3	9.8	13.9	12.9	15.3
Lars	13.3	11.2	14.4	9.8	14.2	12.6	14.8
Newana	13.1	11.3	14.1	9.8	14.2	12.5	15.0
Rambo	12.7	11.9	13.6	10.1	13.6	12.4	14.4
Krona	12.8	10.3	14.1	8.9	13.9	12.0	14.2
Tioga	--	--	--	--	15.6	--	--
site average	13.5	12.3	14.7	10.4	14.4		15.3
p value	0.001	0.008	0.000	0.000	0.000		0.000
CV (S/Mean)	4.29	6.99	2.69	3.21	2.55		3.65
CV(SE/Mean)	2.48	4.04	1.56	1.85	1.47		2.11
LSD 0.05	0.95	1.41	0.65	0.55	0.60		0.92

Table 4. Relative yielding abilities of spring wheat varieties as compared to Newana when grown under dryland conditions in McCone County in cooperation with CES.
Cooperator: Victor Wagner

Cultivar	# of years	1991	1992	1993	1994	1995	Ave	as % of Newana
Amidon	5	32.6	57.5	40.8	32.1	32.6	39.1	121.6
Krona	2	--	--	44.8	--	28.8	36.8	119.1
McNeal	4	--	46.2	48.7	32.0	29.4	39.1	114.8
Lew	5	28.0	55.9	38.5	33.1	28.5	36.8	114.4
Stoa	4	25.0	--	41.2	29.5	30.5	31.6	110.5
Ernest	2	--	--	--	30.8	28.6	29.7	108.8
Rambo	5	29.2	50.0	35.8	30.7	27.9	34.7	108.0
Westbred 936	1	--	--	--	--	27.9	27.9	104.1
Dalen	3	--	44.7	40.1	29.0	--	37.9	104.0
Pioneer 2375	5	22.6	41.7	38.6	35.1	28.6	33.3	103.6
Westbred 926	3	23.7	51.1	--	--	24.5	33.1	101.3
Newana	5	24.6	46.6	35.0	27.8	26.8	32.2	100.0
Kulm	2	--	--	--	30.2	23.6	26.9	98.5
Grandin	4	22.1	--	39.9	25.4	25.0	28.1	98.4
Lars	1	--	--	--	--	26.1	26.1	97.4
Hamer	1	--	--	--	--	25.9	25.9	96.6
Sonja	2	--	--	--	26.2	26.5	26.4	96.5
Trenton	1	--	--	--	--	25.7	25.7	95.9
Norlander	1	--	--	--	--	25.5	25.5	95.1
Pondera	5	20.5	40.5	37.4	25.0	27.8	30.2	94.0
Gus	2	21.6	--	--	31.7	--	26.6	88.8
Bergen	2	--	37.9	--	27.6	--	32.8	88.0
Hi-Line	5	20.3	38.1	32.8	20.6	22.5	26.9	83.5
Express	1	--	--	--	--	21.7	21.7	81.0
Fergus	1	--	--	--	--	21.4	21.4	79.9
Border	2	--	--	--	21.1	17.8	19.4	71.2

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

Table 5. Relative test weights of spring wheat varieties as compared to Newana when grown under dryland conditions in McCone County in cooperation with CES.
Cooperator: Victor Wagner

Cultivar	# of years	1991	1992	1993	1994	1995	Ave	as % of Newana
Dalen	3	--	62.4	60.4	65.1	--	62.6	102.1
Rambo	5	61.0	63.9	60.0	64.3	63.7	62.6	101.6
Grandin	4	60.8	--	61.1	63.8	64.5	62.6	101.5
Lew	5	60.8	62.3	60.8	62.9	63.8	62.1	100.8
Pondera	5	60.3	61.6	60.0	63.5	64.4	62.0	100.6
Pioneer 2375	5	59.6	61.9	59.9	63.8	63.8	61.8	100.3
Westbred 926	3	59.6	63.2	--	--	63.2	62.0	100.3
Fergus	1	--	--	--	--	64.3	64.3	100.3
Trenton	1	--	--	--	--	64.3	64.3	100.3
Kulm	2	--	--	--	64.2	64.0	64.1	100.2
Krona	2	--	--	59.7	--	63.3	61.5	100.2
Gus	2	61.2	--	--	62.9	--	62.0	100.2
Newana	5	59.9	61.5	58.7	63.9	64.1	61.6	100.0
McNeal	4	--	61.7	60.6	62.2	63.3	62.0	99.8
Hi-Line	5	60.3	62.1	57.9	64.3	62.5	61.4	99.7
Amidon	5	59.0	62.4	59.3	62.5	63.8	61.4	99.6
Stoa	4	61.0	--	58.8	62.8	62.9	61.4	99.6
Ernest	2	--	--	--	64.2	63.2	63.7	99.5
Border	2	--	--	--	63.3	63.7	63.5	99.2
Hamer	1	--	--	--	--	63.4	63.4	98.9
Bergen	2	--	60.5	--	63.4	--	62.0	98.8
Norlander	1	--	--	--	--	63.3	63.3	98.8
Sonja	2	--	--	--	62.7	62.8	62.8	98.0
Westbred 936	1	--	--	--	--	62.7	62.7	97.8
Express	1	--	--	--	--	62.4	62.4	97.3
Lars	1	--	--	--	--	62.4	62.4	97.3

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

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

Cultivar	# of years	1991	1992	1993	1994	1995	Ave	as % of Newana
Bergen	2	--	14.9	--	11.1	--	13.0	117.1
Hi-Line	5	16.2	14.4	15.9	11.2	13.8	14.3	112.6
Kulm	2	--	--	--	11.7	14.0	12.8	111.7
Gus	2	16.4	--	--	10.5	--	13.4	111.6
Fergus	1	--	--	--	--	14.6	14.6	111.5
Express	1	--	--	--	--	14.6	14.6	111.5
Dalen	3	--	14.3	15.4		--	13.3	109.6
Border	2	--	--	--	11.6	13.6	12.6	109.6
Grandin	4	16.4	--	16.0	10.3	13.3	14.0	109.4
Norlander	1	--	--	--	--	14.2	14.2	108.4
Hamer	1	--	--	--	--	14.2	14.2	108.4
Westbred 926	3	15.1	13.8	--	--	13.8	14.2	107.8
Ernest	2	--	--	--	10.8	14.0	12.4	107.8
Stoa	4	15.4	--		10.0	13.4	13.8	107.4
Pondera	5	15.1	14.1	15.0	10.7	13.2	13.6	107.2
Pioneer 2375	5	15.7	14.2	15.0	9.8	12.7	13.5	106.1
Amidon	5	15.3	13.0	14.4	10.7	12.8	13.2	104.3
McNeal	4	--	11.8	15.4	10.1	13.8	12.8	103.7
Trenton	1	--	--	--	--	13.5	13.5	103.1
Lew	5	15.1	12.4	14.6	10.0	12.9	13.0	102.4
Westbred 936	1	--	--	--	--	13.4	13.4	102.3
Rambo	5	14.5	13.0	14.7	9.9	12.7	13.0	102.0
Lars	1	--	--	--	--	13.3	13.3	101.5
Sonja	2	--	--	--	10.1	13.2	11.6	101.3
Newana	5	14.2	12.3	14.0	9.9	13.1	12.7	100.0
Krona	2	--	--	14.2	--	12.8	13.5	99.6

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

Table 7. Relative yielding abilities of spring wheat varieties as compared to Newana when grown under dryland conditions in Wibaux County in cooperation with CES.
Cooperator: David Maus

Cultivar	# of years	1989	1991	1992	1993	1995	Ave	as % of Newana
Sonja	1	--	--	--	--	32.3	32.3	125.2
Lars	1	--	--	--	--	32.2	32.2	124.8
Kulm	1	--	--	--	--	31.0	31.0	120.2
Trenton	1	--	--	--	--	30.8	30.8	119.4
Krona	1	--	--	--	--	30.7	30.7	119.0
Norlander	1	--	--	--	--	29.8	29.8	115.5
Stoa	4	40.8	20.4	--	33.9	33.7	32.2	114.8
Amidon	5	43.1	25.6	71.9	33.2	28.6	40.5	113.5
McNeal	3	--	--	59.1	44.3	32.8	45.4	111.5
Pioneer 2375	4	--	32.8	53.9	40.5	27.2	38.6	108.1
Ernest	1	--	--	--	--	27.8	27.8	107.8
Border	1	--	--	--	--	26.6	26.6	103.1
Grandin	4	36.9	20.3	--	33.9	24.1	28.8	102.7
Newana	5	35.6	20.7	66.2	30.1	25.8	35.7	100.0
Rambo	5	35.0	17.9	63.2	33.3	26.9	35.3	98.8
Lew	5	36.0	21.3	54.9	36.5	26.1	35.0	98.0
Gus	2	32.9	21.9	--	--	--	27.4	97.3
Pondera	5	38.3	18.6	55.3	32.6	25.0	34.0	95.2
Westbred 936	1	--	--	--	--	23.5	23.5	91.1
Fergus	1	--	--	--	--	23.1	23.1	89.5
Hamer	1	--	--	--	--	22.6	22.6	87.6
Hi-Line	5	37.0	17.3	47.6	35.1	17.5	30.9	86.6
Dalen	2	--	--	50.0	27.0	--	38.5	80.0
Westbred 926	3	--	19.1	50.1	--	20.7	30.0	79.8
Express	1	--	--	--	--	17.7	17.7	68.6

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 Newana.

Table 8. Relative test weights of spring wheat varieties as compared to Newana when grown under dryland conditions in Wibaux County in cooperation with CES.
Cooperator: David Maus

Cultivar	# of years	1989	1991	1992	1993	1995	Ave	as % of Newana
Dalen	2	--	--	64.4	63.3	--	63.8	102.4
Pondera	5	63.5	58.0	63.9	62.8	62.9	62.2	101.8
Lew	5	63.5	57.8	63.6	62.8	62.2	62.0	101.4
Amidon	5	62.5	58.7	62.4	63.0	62.1	61.7	101.0
Kulm	1	--	--	--	--	63.2	63.2	101.0
Fergus	1	--	--	--	--	63.1	63.1	100.8
Gus	2	61.5	57.6	--	--	--	59.6	100.7
Rambo	5	63.0	57.6	63.8	60.7	62.2	61.5	100.6
Grandin	4	62.0	56.9	--	62.3	62.7	61.0	100.6
Trenton	1	--	--	--	--	62.9	62.9	100.5
Pioneer 2375	4	--	57.0	63.4	61.3	61.8	60.9	100.4
Newana	5	63.0	55.3	63.2	61.5	62.6	61.1	100.0
Border	1	--	--	--	--	62.6	62.6	100.0
Stoa	4	63.0	55.8	--	60.5	61.6	60.2	99.4
Sonja	1	--	--	--	--	61.9	61.9	98.9
Krona	1	--	--	--	--	61.9	61.9	98.9
McNeal	3	--	--	62.0	61.2	61.6	61.6	98.7
Norlander	1	--	--	--	--	61.8	61.8	98.7
Westbred 926	3	--	54.8	63.1	--	61.7	59.9	99.2
Hamer	1	--	--	--	--	61.7	61.7	98.6
Hi-Line	5	61.5	54.2	63.1	60.6	60.8	60.0	98.2
Ernest	1	--	--	--	--	61.4	61.4	98.1
Lars	1	--	--	--	--	61.4	61.4	98.1
Westbred 936	1	--	--	--	--	61.0	61.0	97.4
Express	1	--	--	--	--	60.7	60.7	97.0

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 Newana.

Table_9. Relative protein contents of spring wheat varieties as compared to Newana when grown under dryland conditions in Wibaux County in cooperation with CES.
Cooperator: David Maus

Cultivar	# of years	1989	1991	1992	1993	1995	Ave	as % of Newana
Gus	2	16.3	18.5	--	--	--	17.4	121.7
Westbred 936	1	--	--	--	--	13.1	13.1	115.9
Dalen	2	--	--	15.8	13.2	--	14.5	115.1
Ernest	1	--	--	--	--	13.0	13.0	115.0
Grandin	4	15.5	17.6	--	12.8	12.5	14.6	114.7
Fergus	1	--	--	--	--	12.9	12.9	114.2
Hi-Line	5	14.7	18.3	14.6	13.2	13.0	14.8	113.4
Westbred 926	3	--	17.7	15.2	--	13.4	15.4	110.0
Kulm	1	--	--	--	--	12.4	12.4	109.7
Lew	5	13.1	18.0	14.4	12.2	13.1	14.2	108.8
Border	1	--	--	--	--	12.3	12.3	108.8
Pondera	5	12.7	17.4	14.2	12.5	13.6	14.1	108.1
Express	1	--	--	--	--	12.1	12.1	107.1
Norlander	1	--	--	--	--	12.1	12.1	107.1
Hamer	1	--	--	--	--	12.1	12.1	107.1
Stoa	4	12.7	18.0	--	11.8	11.9	13.6	106.9
Pioneer 2375	4	--	17.2	14.6	12.6	12.2	14.2	106.6
McNeal	3	--	--	14.8	12.0	12.1	13.0	106.6
Sonja	1	--	--	--	--	11.9	11.9	105.3
Rambo	5	12.9	18.1	13.2	12.2	11.9	13.7	104.9
Trenton	1	--	--	--	--	11.8	11.8	104.4
Amidon	5	12.5	16.8	14.2	11.6	12.8	13.6	104.3
Newana	5	12.0	16.6	14.2	11.0	11.3	13.0	100.0
Lars	1	--	--	--	--	11.2	11.2	99.1
Krona	1	--	--	--	--	10.3	10.3	91.2

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 Newana.

Table 10 Relative yielding abilities of spring wheat varieties as compared to Newana when grown under dryland conditions in Roosevelt County in cooperation with CES.
Cooperator: Mark Swank

Cultivar	# of years	1990	1992	1993	1994	1995	Ave	as % of Newana
Express	1	--	--	--	--	36.9	36.9	110.1
McNeal	4	--	58.3	61.5	50.9	38.1	52.2	109.7
Lars	1	--	--	--	--	36.4	36.4	108.7
Amidon	5	26.5	58.9	55.1	52.5	37.2	46.0	107.8
Krona	2	--	--	56.9	--	36.9	46.9	105.3
Norlander	1	--	--	--	--	34.6	34.6	103.3
Grandin	4	25.6	--	59.4	46.2	33.8	41.2	102.2
Gus	2	21.7	--	--	50.7	--	36.2	100.0
Newana	5	23.2	52.1	55.6	49.2	33.5	42.7	100.0
Stoa	4	23.5	--	53.4	46.8	34.1	39.4	97.7
Pioneer 2375	4	--	44.3	54.2	55.1	30.1	45.9	96.5
Ernest	2	--	--	--	45.5	34.0	39.8	96.1
Fergus	1	--	--	--	--	32.0	32.0	95.5
Dalen	3	--	50.8	47.7	51.0	--	49.8	95.3
Lew	5	23.0	54.4	46.7	46.3	32.8	40.6	95.1
Westbred 936	1	--	--	--	--	31.8	31.8	94.9
Hi-Line	5	23.8	44.1	51.8	48.7	33.7	40.4	94.6
Kulm	2	--	--	--	45.4	32.4	38.9	94.1
Trenton	1	--	--	--	--	31.3	31.3	93.4
Sonja	2	--	--	--	54.5	22.6	38.6	93.2
Pondera	5	24.9	44.1	51.0	40.5	33.3	38.8	90.7
Bergen	2	--	37.6	--	53.3	--	45.4	89.7
Rambo	5	23.1	47.2	46.5	42.7	28.2	37.5	87.9
Border	2	--	--	--	42.9	29.6	36.2	87.7
Hamer	1	--	--	--	--	28.0	28.0	83.6
Westbred 926	3	23.5	39.4	--	--	25.5	29.5	81.2

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

Table 11 Relative test weights of spring wheat varieties as compared to Newana when grown under dryland conditions in Roosevelt County in cooperation with CES.
Cooperator: Mark Swank

Cultivar	# of years	1990	1992	1993	1994	1995	Ave	as % of Newana
Kulm	2	--	--	--	63.2	62.1	62.6	104.9
Ernest	2	--	--	--	63.4	59.0	61.2	102.5
Dalen	3	--	65.0	60.9	62.4	--	62.8	102.3
Lew	5	58.5	64.5	61.4	62.5	59.9	61.4	101.6
Pioneer 2375	4	--	64.0	60.7	62.4	59.0	61.5	101.5
Grandin	4	59.4	--	61.1	61.6	58.3	60.1	101.0
Krona	2	--	--	60.5	--	58.1	59.3	100.9
Rambo	5	60.6	64.2	59.7	60.9	59.2	60.9	100.8
McNeal	4	--	63.3	61.0	61.2	58.8	61.1	100.7
Border	2	--	--	--	61.8	58.3	60.0	100.6
Pondera	5	59.2	63.3	60.1	61.5	59.4	60.7	100.5
Bergen	2	--	63.6	--	61.9	--	62.8	100.3
Norlander	1	--	--	--	--	58.7	58.7	100.3
Amidon	5	58.3	63.1	60.7	62.0	58.5	60.5	100.2
Hamer	1	--	--	--	--	58.6	58.6	100.2
Newana	5	59.6	64.0	59.1	60.9	58.5	60.4	100.0
Gus	2	59.0	--	--	61.4	--	60.2	99.9
Stoa	4	58.5	--	60.5	60.9	57.2	59.3	99.6
Hi-Line	5	57.1	64.2	59.8	61.5	57.3	60.0	99.3
Express	1	--	--	--	--	58.0	58.0	99.1
Trenton	1	--	--	--	--	57.9	57.9	99.0
Lars	1	--	--	--	--	57.8	57.8	98.8
Sonja	2	--	--	--	61.2	56.6	58.9	98.7
Fergus	1	--	--	--	--	57.6	57.6	98.5
Westbred 926	3	58.5	63.3	--	--	56.3	59.4	97.8
Westbred 936	1	--	--	--	--	55.9	55.9	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 Newana.

Table 12. Relative protein contents of spring wheat varieties as compared to Newana when grown under dryland conditions in Roosevelt County in cooperation with CES.
Cooperator: Mark Swank

Cultivar	# of years	1990	1992	1993	1994	1995	Ave	as % of Newana
Dalen	3	--	14.6	14.2	11.7	--	13.5	112.8
Hi-Line	5	17.7	14.7	14.2	11.8	15.1	14.7	110.7
Gus	2	18.2	--	--	12.3	--	15.2	110.5
Stoa	4	17.2	--	14.6	12.1	15.3	14.8	110.2
Bergen	2	--	14.3	--	12.0	--	13.2	110.0
Trenton	1	--	--	--	--	15.4	15.4	109.2
Kulm	2	--	--	--	12.5	15.1	13.8	109.1
Westbred 926	3	17.6	14.5	--	--	14.6	15.6	108.1
Lew	5	17.8	13.0	14.0	11.9	14.9	14.3	107.8
Grandin	4	17.3	--	13.7	11.7	15.1	14.4	107.6
Amidon	5	17.3	14.0	14.2	11.4	14.5	14.3	107.5
Pioneer 2375	4	--	14.0	13.2	11.6	14.8	13.4	107.2
Ernest	2	--	--	--	12.1	15.0	13.6	107.1
Pondera	5	17.8	13.8	13.6	11.5	14.3	14.2	106.9
McNeal	4	--	13.2	13.5	11.3	15.3	13.3	106.6
Hamer	1	--	--	--	--	15.0	15.0	106.4
Sonja	2	--	--	--	11.7	14.9	13.3	105.1
Westbred 936	1	--	--	--	--	14.6	14.6	103.5
Express	1	--	--	--	--	14.6	14.6	103.5
Rambo	5	16.5	12.7	14.1	11.6	13.6	13.7	103.2
Fergus	1	--	--	--	--	14.4	14.4	102.1
Lars	1	--	--	--	--	14.4	14.4	102.1
Border	2	--	--	--	11.6	14.2	12.9	102.0
Norlander	1	--	--	--	--	14.3	14.3	101.4
Newana	5	6.4	2.7	2.0	1.2	4.1	13.3	100.0
Krona	2	--	--	12.0	--	14.1	13.0	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 Newana.

Table 13 Relative yielding abilities of spring wheat varieties as compared to Newana when grown under dryland conditions in Sheridan County in cooperation with CES.
Cooperator: Max Aasheim

Cultivar	# of years	1991	1992	1993	1994	1995	Ave	as % of Newana
Krona	2	--	--	28.4	--	34.2	31.3	117.7
Sonja	2	--	--	--	61.0	29.2	45.1	115.1
McNeal	4	--	38.3	31.7	58.2	29.9	39.5	110.6
Grandin	4	25.4	--	48.6	49.0	23.6	36.6	109.9
Lars	1	--	--	--	--	29.1	29.1	107.8
Express	1	--	--	--	--	29.0	293.0	107.4
Norlander	1	--	--	--	--	29.0	29.0	107.4
Rambo	5	31.4	41.7	37.2	47.2	26.4	36.8	107.1
Stoa	4	30.2	--	27.5	57.6	24.8	35.0	105.0
Amidon	5	29.3	35.2	27.8	54.0	28.5	35.0	101.8
Border	2	--	--	--	54.4	24.6	39.5	100.8
Newana	5	28.8	38.3	26.2	51.4	27.0	34.2	100.0
Ernest	2	--	--	--	52.2	26.2	39.2	100.0
Lew	5	32.0	36.5	24.7	51.4	26.6	34.2	99.7
Trenton	1	--	--	--	--	26.5	26.5	98.1
Bergen	2	--	27.9	--	59.7	--	43.8	97.7
Fergus	1	--	--	--	--	26.0	26.0	96.3
Kulm	2	--	--	--	51.1	24.2	37.6	96.0
Pioneer 2375	5	35.4	18.3	26.6	58.0	26.3	32.9	95.9
Hamer	1	--	--	--	--	25.6	25.6	94.8
Gus	2	28.5	--	--	47.4	--	38.0	94.6
Pondera	5	26.8	34.3	23.8	48.4	28.6	32.4	94.3
Hi-Line	5	30.5	30.9	18.7	51.8	27.7	31.9	93.0
Dalen	3	--	23.6	26.5	55.0	--	35.0	90.7
Westbred 926	3	30.7	26.7	--	--	26.0	27.8	88.6
Westbred 936	1	--	--	--	--	22.8	22.8	84.4

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 Newana.

Table 14. Relative test weights of spring wheat varieties as compared to Newana when grown under dryland conditions in Sheridan County in cooperation with CES.
Cooperator: Max Aasheim

Cultivar	# of years	1991	1992	1993	1994	1995	Ave	as % of Newana
Kulm	2	--	--	--	63.4	63.0	63.2	104.4
Dalen	3	--	62.8	62.3	61.4	--	62.2	102.8
Lew	5	63.1	63.1	62.7	60.0	63.1	62.4	101.9
Border	2	--	--	--	61.6	61.6	61.6	101.7
Ernest	2	--	--	--	62.2	60.7	61.4	101.5
Grandin	4	63.3	--	61.1	60.5	62.7	61.9	101.2
Pioneer 2375	5	63.3	61.1	61.2	61.8	60.6	61.6	100.6
Hi-Line	5	63.1	61.6	60.0	61.4	61.7	61.6	100.5
Pondera	5	62.4	61.8	61.3	60.0	62.1	61.5	100.4
Amidon	5	63.1	60.8	61.7	59.9	61.7	61.4	100.3
Rambo	5	63.5	62.4	60.3	59.4	61.2	61.4	100.2
McNeal	4	--	60.6	61.0	60.5	61.9	61.0	100.2
Stoa	4	63.1	--	60.4	60.0	61.3	61.2	100.1
Gus	2	62.2	--	--	59.8	--	61.0	100.1
Newana	5	62.8	61.7	60.7	59.1	62.0	61.3	100.0
Sonja	2	--	--	--	60.0	60.9	60.4	99.8
Bergen	2	--	60.5	--	60.1	--	60.3	99.8
Express	1	--	--	--	--	61.9	61.9	99.8
Krona	2	--	--	61.4	--	60.9	61.2	99.7
Fergus	1	--	--	--	--	61.8	61.8	99.7
Trenton	1	--	--	--	--	61.4	61.4	99.0
Westbred 926	3	62.8	61.6	--	--	59.7	61.4	98.7
Norlander	1	--	--	--	--	60.6	60.6	97.7
Hamer	1	--	--	--	--	60.1	60.1	96.9
Westbred 936	1	--	--	--	--	59.8	59.8	96.5
Lars	1	--	--	--	--	59.0	59.0	95.2

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 Newana.

Table 15 Relative protein contents of spring wheat varieties as compared to Newana when grown under dryland conditions in Sheridan County in cooperation with CES.
Cooperator: Max Aasheim

Cultivar	# of years	1991	1992	1993	1994	1995	Ave	as % of Newana
Gus	2	14.5	--	--	14.8	--	14.6	113.1
Fergus	1	--	--	--	--	10.9	10.9	111.2
Westbred 936	1	--	--	--	--	10.8	10.8	110.2
Dalen	3	--	14.6	15.2	12.0	--	13.9	108.9
Border	2	--	--	--	13.6	11.0	12.3	108.8
Sonja	2	--	--	--	14.2	10.4	12.3	108.8
Westbred 926	3	13.7	14.2	--	--	11.0	13.0	107.8
Hi-Line	5	13.8	13.6	14.6	12.7	11.2	13.2	107.5
Kulm	2	--	--	--	13.5	10.8	12.2	107.5
Ernest	2	--	--	--	13.9	10.4	12.2	107.5
Stoa	4	13.5	--	13.6	14.2	10.0	12.8	106.7
Express	1	--	--	--	--	10.4	10.4	106.1
Lew	5	13.5	13.3	14.0	13.9	10.3	13.0	106.0
Amidon	5	13.6	13.4	14.0	14.0	10.0	13.0	106.0
Pondera	5	13.8	13.4	14.2	13.2	10.4	13.0	106.0
Hamer	1	--	--	--	--	10.3	10.3	105.1
Bergen	2	--	13.6	--	13.5	--	13.6	104.2
McNeal	4	--	13.9	12.8	12.8	10.4	12.5	103.5
Grandin	4	13.6	--	13.7	12.2	10.3	12.4	103.5
Rambo	5	13.6	12.8	14.4	12.5	10.1	12.7	103.4
Trenton	1	--	--	--	--	10.1	10.1	103.1
Krona	2	--	--	13.9	--	8.9	11.4	102.7
Pioneer 2375	5	13.5	13.0	13.0	12.4	10.2	12.4	101.3
Newana	5	13.1	13.2	12.4	12.8	9.8	12.3	100.0
Lars	1	--	--	--	--	9.8	9.8	100.0
Norlander	1	--	--	--	--	9.8	9.8	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 Newana.

Table 16. Relative yielding abilities of spring wheat varieties as compared to Newana when grown under dryland conditions in Valley County in cooperation with CES.
Cooperator: Bill Lauckner

Cultivar	# of years	1991	1992	1993	1994	1995	Ave	as % of Newana
Westbred 936	1	--	--	--	--	48.1	48.1	156.7
Norlander	1	--	--	--	--	47.1	47.1	153.4
Express	1	--	--	--	--	47.1	47.1	153.4
Lars	1	--	--	--	--	45.3	45.3	147.6
Krona	2	--	--	42.2	--	45.3	43.8	133.2
Hamer	1	--	--	--	--	40.3	40.3	131.3
Fergus	1	--	--	--	--	37.6	37.6	122.4
McNeal	4	--	55.6	58.7	60.0	44.0	54.6	122.2
Grandin	4	39.1	--	45.3	45.9	42.4	43.2	109.9
Sonja	2	--	--	--	60.6	38.4	49.5	107.6
Amidon	5	32.8	51.2	45.1	51.4	43.7	44.8	107.3
Trenton	1	--	--	--	--	32.9	32.9	107.2
Stoa	4	29.5	--	38.3	56.0	40.6	41.1	104.6
Border	2	--	--	--	50.1	45.8	48.0	104.2
Pioneer 2375	5	38.1	52.2	42.8	52.4	31.4	43.4	103.8
Westbred 926	3	42.7	37.5	--	--	35.7	38.6	102.9
Hi-Line	5	37.5	49.9	36.3	48.0	39.3	42.2	101.0
Pondera	5	35.4	45.0	37.1	54.0	39.6	42.2	101.0
Rambo	5	31.6	41.5	36.3	64.8	35.5	41.9	100.4
Newana	5	30.2	51.7	35.0	61.3	30.7	41.8	100.0
Dalen	3	--	49.7	38.4	58.7	--	48.9	99.2
Kulm	2	--	--	--	52.8	38.3	45.6	99.0
Ernest	2	--	--	--	52.8	37.4	45.1	98.0
Tioga	2	--	--	--	53.1	36.4	44.8	97.3
Lew	5	28.0	49.5	36.4	54.8	32.0	40.1	96.1
Gus	2	30.8	--	--	53.9	--	42.4	92.6
Bergen	2	--	43.5	--	54.6	--	49.0	86.8

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 Newana.

Table17. Relative test weights of spring wheat varieties as compared to Newana when grown under dryland conditions in Valley County in cooperation with CES.
Cooperator: Bill Lauckner

Cultivar	# of years	1991	1992	1993	1994	1995	Ave	as % of Newana
Kulm	2	--	--	--	63.8	61.2	62.5	105.8
Ernest	2	--	--	--	63.2	59.9	61.6	104.1
Lew	5	63.3	63.7	58.7	61.9	60.8	61.9	103.1
Dalen	3	--	65.4	59.2	61.4	--	62.0	102.9
Gus	2	62.2	--	--	61.4	--	61.8	102.7
Rambo	5	62.6	64.7	58.1	62.3	60.2	61.6	102.6
Trenton	1	--	--	--	--	59.9	59.9	102.2
Amidon	5	60.5	64.2	58.5	62.1	60.8	61.2	102.0
Tioga	2	--	--	--	61.5	59.0	60.2	101.9
Fergus	1	--	--	--	--	59.7	59.7	101.9
Pioneer 2375	5	62.0	64.8	57.7	60.6	60.0	61.0	101.7
Pondera	5	60.5	64.4	57.9	62.5	59.6	61.0	101.6
Border	2	--	--	--	59.3	60.5	59.9	101.4
Express	1	--	--	--	--	59.4	59.4	101.4
Bergen	2	--	63.8	--	61.3	--	62.6	101.1
Grandin	4	59.0	--	60.0	60.2	58.6	59.4	100.8
Stoa	4	62.4	--	56.5	59.7	58.8	59.4	100.7
McNeal	4	--	63.2	59.4	58.3	59.6	60.1	100.5
Newana	5	60.8	64.3	56.8	59.6	58.6	60.0	100.0
Westbred 936	1	--	--	--	--	58.6	58.6	100.0
Hamer	1	--	--	--	--	58.4	58.4	99.7
Hi-Line	5	59.5	64.7	57.1	58.4	59.0	59.7	99.5
Sonja	2	--	--	--	58.9	58.2	58.6	99.1
Norlander	1	--	--	--	--	58.1	58.1	99.1
Westbred 926	3	59.0	63.5	--	--	58.1	60.2	98.3
Krona	2	--	--	57.0	--	56.4	56.7	98.2
Lars	1	--	--	--	--	57.4	57.4	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 Newana.

Table 18. Relative protein contents of spring wheat varieties as compared to Newana when grown under dryland conditions in Valley County in cooperation with CES.
Cooperator: Bill Lauckner

Cultivar	# of years	1991	1992	1993	1994	1995	Ave	as % of Newana
Westbred 926	3	--	16.3	16.2	--	14.7	15.7	107.8
Dalen	3	--	15.9	16.4	14.1	--	15.5	106.7
Stoa	4	16.5	--	16.4	14.9	15.1	15.7	106.2
Tioga	1	--	--	--	14.2	15.6	14.9	106.0
Gus	2	17.3	--	--	14.5	--	15.9	105.6
McNeal	4	--	15.5	15.4	15.0	14.8	15.2	105.2
Ernest	2	--	--	--	14.7	14.8	14.8	105.0
Hi-Line	5	16.7	16.0	14.5	15.6	14.6	15.5	104.7
Grandin	4	16.9	--	15.8	14.8	14.5	15.5	104.7
Westbred 936	1	--	--	--	--	14.8	14.8	104.2
Trenton	1	--	--	--	--	14.8	14.8	104.2
Pondera	5	16.5	15.9	15.8	14.1	14.5	15.4	103.9
Fergus	1	--	--	--	--	14.7	14.7	103.5
Kulm	2	--	--	--	14.5	14.5	14.5	103.2
Lew	5	17.2	14.8	15.4	13.8	15.0	15.2	103.1
Sonja	2	--	--	--	14.0	14.6	14.3	101.8
Amidon	5	16.3	14.8	15.3	14.2	14.2	15.0	101.2
Pioneer 2375	5	16.3	15.4	14.6	13.7	14.5	14.9	100.8
Rambo	5	16.3	15.4	15.4	13.7	13.6	14.9	100.7
Krona	2	--	--	15.3	--	13.9	14.6	100.3
Bergen	2	--	15.6	--	13.1	--	14.4	100.3
Newana	5	16.2	14.7	14.9	13.9	14.2	14.8	100.0
Lars	1	--	--	--	--	14.2	14.2	100.0
Express	1	--	--	--	--	14.1	14.1	99.3
Norlander	1	--	--	--	--	13.9	13.9	97.9
Border	2	--	--	--	13.7	13.7	13.7	97.5
Hamer	1	--	--	--	--	13.7	13.7	96.5

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 Newana.

Table 19 Relative yielding abilities of spring wheat varieties as compared to Newana when grown under irrigated conditions in Valley County in cooperation with CES.
Cooperator: Kelly Donovan

Cultivar	# of years	1991	1992	1993	1994	1995	Ave	as % of Newana
Hamer	1	--	--	--	--	53.5	53.5	156.9
Express	2	--	75.8	--	--	58.2	67.0	141.1
Lars	1	--	--	--	--	45.2	45.2	132.6
Pioneer 2375	4	72.9	--	71.8	74.0	66.9	71.4	131.7
Norlander	1	--	--	--	--	44.6	44.6	130.8
Gus	4	59.1	52.3	55.0	75.5	--	60.5	122.7
Krona	2	--	--	68.0	--	43.2	55.6	119.4
Sonja	3	--	--	81.8	85.9	39.2	69.0	119.0
Westbred 936	2	--	63.2	--	--	45.6	54.4	114.5
Westbred 926	3	58.4	58.5	--	--	40.2	52.4	113.8
Trenton	1	--	--	--	--	37.4	37.4	109.7
Stoa	3	59.3	--	--	78.2	35.5	57.7	109.6
McNeal	4	--	61.5	64.3	89.9	40.3	64.0	109.1
Fergus	1	--	--	--	--	37.2	37.2	109.1
Hi-Line	5	61.6	61.1	61.4	81.3	36.6	60.4	108.7
Lew	3	53.7	--	--	75.5	39.8	56.3	107.0
Dalen	2	--	--	61.6	87.6	--	74.6	106.8
Grandin	4	45.8	--	68.9	73.3	40.0	57.0	105.1
Rambo	4	47.0	54.6	--	81.0	43.7	56.6	103.4
Amidon	5	56.0	60.9	61.8	74.4	33.0	57.2	103.0
Bergen	3	--	66.7	58.6	79.6	--	68.3	102.1
Newana	5	43.1	60.9	59.0	80.7	34.1	55.6	100.0
Pondera	5	52.3	54.5	58.8	67.6	32.0	53.0	95.5
Kulm	2	--	--	--	66.3	38.6	52.4	91.4
Ernest	2	--	--	--	61.1	40.2	50.6	88.2
Border	2	--	--	--	62.0	31.8	46.9	81.7

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 Newana.

Table 20 Relative test weights of spring wheat varieties as compared to Newana when grown under irrigated conditions in Valley County in cooperation with CES.
Cooperator: Kelly Donovan

Cultivar	# of years	1991	1992	1993	1994	1995	Ave	as % of Newana
Hamer	1	--	--	--	--	59.5	59.5	104.4
Pioneer 2375	4	63.5	--	61.7	64.8	60.5	62.6	103.1
Express	2	--	58.8	--	--	59.9	59.4	102.8
Kulm	2	--	--	--	63.7	60.1	61.9	102.7
Dalen	2	--	--	61.4	65.0	--	63.2	102.7
Lew	3	62.0	--	--	64.9	61.0	62.6	102.5
Grandin	4	64.9	--	61.4	63.8	58.6	62.2	102.4
Rambo	4	63.5	60.1	--	64.7	59.2	61.9	102.3
Norlander	1	--	--	--	--	58.2	58.2	102.1
Amidon	5	63.0	61.2	61.0	63.3	58.6	61.4	101.9
Pondera	5	64.0	62.0	60.7	63.2	57.3	61.4	101.9
Sonja	3	--	--	62.0	63.9	57.7	61.2	101.9
Bergen	3	--	60.5	60.8	63.3	--	61.5	101.7
Trenton	1	--	--	--	--	57.7	57.7	101.2
Hi-Line	5	61.5	60.8	60.6	64.4	57.0	60.9	101.0
McNeal	4	--	59.3	60.2	63.2	56.8	59.9	100.4
Krona	2	--	--	60.0	--	56.9	58.4	100.3
Westbred 936	2	--	60.9	--	--	54.9	57.9	100.3
Stoa	3	62.0	--	--	64.9	56.8	61.2	100.2
Newana	5	62.8	58.5	59.5	63.6	57.0	60.3	100.0
Gus	4	61.5	59.6	60.0	63.2	--	61.1	100.0
Ernest	2	--	--	--	64.1	58.7	60.0	99.6
Lars	1	--	--	--	--	56.6	56.6	99.3
Border	2	--	--	--	63.8	55.7	59.8	99.1
Westbred 926	3	60.0	57.1	--	--	54.2	57.1	96.1
Fergus	1	--	--	--	--	54.8	54.8	96.1

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 Newana.

Table 21 Relative protein contents of spring wheat varieties as compared to Newana when grown under irrigated conditions in Valley County in cooperation with CES.
Cooperator: Kelly Donovan

Cultivar	# of years	1991	1992	1993	1994	1995	Ave	as % of Newana
Gus	4	15.7	14.6	16.2	16.0	--	15.6	116.8
Kulm	2	--	--	--	17.7	16.2	17.0	116.1
Ernest	2	--	--	--	17.2	15.7	16.4	112.7
Dalen	2	--	--	14.8	15.6	--	15.2	110.9
Stoa	3	14.9	--	--	15.9	15.8	15.5	109.9
Fergus	1	--	--	--	--	16.0	16.0	106.7
Grandin	4	14.6	--	14.6	15.1	14.8	14.8	
Hi-Line	5	14.4	13.0	14.8	14.7	15.3	14.4	105.4
Lew	3	14.4	--	--	14.5	15.8	14.9	105.4
Trenton	1	--	--	--	--	15.8	15.8	105.3
Pioneer 2375	4	14.3	--	13.6	15.3	15.2	14.6	105.0
Westbred 936	2	--	13.2	--	--	16.1	14.6	105.0
McNeal	4	--	12.8	14.4	15.2	15.4	14.4	104.5
Sonja	3	--	--	13.8	15.3	15.2	14.8	104.5
Amidon	5	13.9	12.9	13.9	15.3	15.3	14.3	104.1
Pondera	5	13.5	12.8	14.5	14.9	15.4	14.2	103.8
Westbred 926	3	14.2	12.9	--	--	15.5	14.2	103.6
Border	2	--	--	--	15.4	14.7	15.0	103.1
Bergen	3	--	12.2	14.2	14.8	--	13.7	102.2
Norlander	1	--	--	--	--	15.3	15.3	102.0
Newana	5	13.2	12.9	13.2	14.2	15.0	13.7	100.0
Lars	1	--	--	--	--	14.8	14.8	98.7
Hamer	1	--	--	--	--	14.7	14.7	98.0
Krona	2	--	--	13.4	--	14.2	13.8	97.9
Rambo	4	12.9	12.2	--	14.1	14.4	13.4	96.9
Express	2	--	12.1	--	--	14.5	13.3	95.3

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 Newana.

Table 22. Summary of durum yields at two offstation dryland sites in Montana.

Variety	yield, bu/ac			test weight			protein		
	Poplar	Reserve	Average	Poplar	Reserve	Average	Poplar	Reserve	Average
Kyle	45.3	33.2	39.2	61.0	63.3	62.2	16.0	9.2	12.6
Munich	43.2	27.5	35.4	61.9	62.0	62.0	14.9	9.4	12.2
Vic	39.4	31.2	35.3	59.2	61.0	60.1	16.7	9.2	13.0
Renville	40.2	29.5	34.8	60.8	61.2	61.0	15.6	8.8	12.2
Medora	40.0	29.3	34.6	61.4	62.2	61.8	15.6	9.7	12.6
Plenty	40.6	26.9	33.8	60.8	62.1	61.4	15.7	9.3	12.5
Voss	38.7	28.7	33.7	61.1	62.5	61.8	14.9	10.0	12.4
Monroe	37.3	28.9	33.1	60.2	59.8	60.0	15.3	9.2	12.2
Ward	38.0	26.6	32.3	62.0	61.3	61.6	15.2	9.2	12.2
Laker	37.6	26.6	32.1	61.6	63.0	62.3	14.2	9.2	11.7
Site average	40.0	28.5		61.0	61.8		15.4	9.3	
p value	0.001	0.007		0.000	0.000		0.000	0.264	
CV (S/mean)	4.53	6.57		0.58	0.82		1.12	5.01	
CV (SE/mean	2.62	3.79		0.34	0.47		0.65	2.89	
LSD 0.05	3.11	3.25		0.61	0.87		0.30	NS	
Planting date	15 May	16 May							
Harvest date	24 Aug	24 Aug							

Table 23. Relative yielding abilities of durum varieties as compared to Ward when grown under dryland conditions in Roosevelt County in cooperation with CES.
Cooperator: Mark Swank

Cultivar	# of years	1990	1992	1993	1994	1995	Ave	as % of Ward
Munich	1	--	--	--	--	43.2	43.2	113.7
Renville	5	20.4	48.0	53.5	53.8	40.2	43.2	109.2
Kyle	2	--	--	--	52.8	45.3	49.0	107.4
Plenty	2	--	--	--	54.2	40.6	47.4	103.8
Voss	1	--	--	--	--	38.7	38.7	101.8
Ward	5	20.6	44.6	41.3	53.3	38.0	39.6	100.0
Medora	5	19.3	43.2	45.2	49.4	40.0	39.4	99.6
Vic	3	17.1	--	--	47.9	39.4	34.8	93.3
Monroe	5	16.8	36.3	43.7	48.2	37.3	36.5	92.2
Laker	3	22.3	--	--	41.4	37.7	33.8	90.6

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 Ward.

Table 24. Relative test weights of durum varieties as compared to Ward when grown under dryland conditions in Roosevelt County in cooperation with CES.
Cooperator: Mark Swank

Cultivar	# of years	1990	1992	1993	1994	1995	Ave	as % of Ward
Medora	5	63.1	63.6	62.0	61.9	61.4	62.4	100.5
Ward	5	61.9	63.2	61.3	62.2	62.0	62.1	100.0
Renville	5	62.6	63.2	61.8	61.5	60.8	62.0	99.8
Munich	1	--	--	--	--	61.9	61.9	99.8
Laker	3	64.0	--	--	59.4	61.6	61.7	99.4
Vic	3	63.3	--	--	61.9	59.2	61.5	99.1
Kyle	2	--	--	--	61.6	61.0	61.3	98.7
Voss	1	--	--	--	--	61.1	61.1	98.5
Plenty	2	--	--	--	61.2	60.8	61.0	98.2
Monroe	5	59.4	63.1	60.2	61.7	60.2	60.9	98.1

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 Ward.

Table 25 Relative protein contents of durum varieties as compared to Ward when grown under dryland conditions in Roosevelt County in cooperation with CES.
Cooperator: Mark Swank

Cultivar	# of years	1991	1992	1993	1994	1995	Ave	as % of Ward
Vic	3	18.7	--	--	12.2	16.7	15.9	103.7
Medora	5	20.3	15.0	12.3	11.9	15.8	15.1	103.6
Kyle	2	--	--	--	11.6	16.0	13.8	101.8
Plenty	2	--	--	--	11.6	15.7	13.6	100.7
Monroe	5	18.8	14.4	12.2	12.2	15.3	14.6	100.3
Ward	5	18.8	14.8	12.0	11.9	15.2	14.5	100.0
Renville	5	19.0	14.6	11.2	11.4	15.6	14.4	98.8
Voss	1	--	--	--	--	14.9	14.9	98.0
Munich	1	--	--	--	--	14.9	14.9	98.0
Laker	3	16.5	--	--	12.1	14.2	14.3	93.2

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 Ward.

Table 26. Relative yielding abilities of durum varieties as compared to Ward when grown under dryland conditions in Sheridan County in cooperation with CES.
Cooperator: Max Aasheim

Cultivar	# of years	1991	1992	1993	1994	1995	Ave	as % of Ward
Kyle	2	--	--	--	63.1	33.2	48.2	110.6
Plenty	3	--	48.0	--	65.3	26.9	46.7	110.4
Voss	1	--	--	--	--	28.7	28.7	107.9
Renville	5	34.9	43.5	21.7	62.8	29.5	38.5	104.5
Munich	1	--	--	--	--	27.5	27.5	103.4
Medora	5	37.1	40.2	19.7	57.9	29.3	36.8	100.1
Ward	5	35.9	39.9	21.2	60.5	26.6	36.8	100.0
Vic	3	29.8	--	--	61.8	31.2	40.9	99.8
Monroe	5	32.8	43.8	17.9	57.4	28.9	36.2	98.2
Laker	3	33.9	--	--	36.5	26.6	32.3	78.9

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

Table 27. Relative test weights of durum varieties as compared to Ward when grown under dryland conditions in Sheridan County in cooperation with CES.
Cooperator: Max Aasheim

Cultivar	# of years	1991	1992	1993	1994	1995	Ave	as % of Ward
Voss	1	--	--	--	--	62.5	62.5	102.0
Munich	1	--	--	--	--	62.0	62.0	101.1
Medora	5	63.5	61.2	62.3	60.1	62.2	61.9	100.7
Vic	3	63.5	--	--	61.0	61.0	61.8	100.5
Kyle	2	--	--	--	58.8	63.3	61.0	100.5
Plenty	3	--	60.9	--	59.5	62.1	60.8	100.1
Renville	5	63.8	61.5	61.8	58.9	61.2	61.4	100.0
Ward	5	63.1	60.9	61.6	60.2	61.3	61.4	100.0
Laker	3	63.8	--	--	56.5	63.0	61.1	99.3
Monroe	5	62.6	60.1	60.3	60.4	59.8	60.6	98.7

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 Ward.

Table 28. Relative protein contents of durum varieties as compared to Ward when grown under dryland conditions in Sheridan County in cooperation with CES.
Cooperator: Max Aasheim

Cultivar	# of years	1991	1992	1993	1994	1995	Ave	as % of Ward
Voss	1	--	--	--	--	10.0	10.0	108.7
Medora	5	14.3	13.4	14.2	15.6	9.7	13.4	103.4
Vic	3	14.6	--	--	15.1	9.2	13.0	102.4
Munich	1	--	--	--	--	9.4	9.4	102.2
Monroe	5	14.4	12.9	15.0	14.8	9.2	13.3	102.0
Plenty	3	--	13.6	--	14.8	9.3	12.3	101.6
Ward	5	13.3	12.4	14.6	15.5	9.2	13.0	100.0
Renville	5	13.9	12.5	13.9	15.2	8.8	12.9	98.9
Laker	3	13.1	--	--	13.7	9.2	12.0	94.7
Kyle	2	--	--	--	14.1	9.2	11.6	94.3

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 Ward.