

164

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

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PROJECT PERSONNEL:
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OBJECTIVE:
To evaluate new varieties of spring wheat and durum in different environments in eastern Montana, and to compare those new varieties with varieties currently being grown.

RESULTS:

Spring wheat

McCone County: Dryland, cooperators: Victor Wagner

Eighteen spring wheat varieties were tested (Table 1). The experimental site was fallow in 1993. Pioneer 2375, Lew, and Amidon were the highest yielders. The average yield at this site was 28.1 bu/acre. Five-year summaries for yield, test weight, and protein are shown in Tables 2 through 4.

Wibaux County: Dryland, cooperators: David Maus

The 1994 plots were abandoned due to severe wild oat infestation. Five-year summaries for yield, test weight, and protein for the 1989-1993 period are shown in Tables 5 through 7.

Roosevelt County: Dryland, cooperators: Mark Swank

Eighteen spring wheat varieties were tested (Table 8) at this site. The experimental site was fallow in 1993. Pioneer 2375, Sonja, and Bergen were the highest yielding varieties. Average yield was 48.5 bu/acre. Relative yields, test weights, and proteins for five years are shown in Tables 9 through 11.

Sheridan County: Dryland, cooperators: Max Aasheim

Eighteen spring wheat varieties were tested (Table 12). The experimental site was fallow in 1993. Highest yielding varieties were Sonja, Bergen, and McNeal. Average yield was 53.1 bu/acre. Relative yields, test weights, and proteins for five years are shown in Tables 13 through 15.

Sheridan County: Irrigated, cooperators: Steve Brekke

The 1994 plots were abandoned due to severe weed infestation. Five year summaries for yield, test weight, and protein for the 1989-1993 period are shown in Tables 16 through 18.

Valley County: Dryland, cooperators: Bill Lauckner

Nineteen spring wheat varieties were tested (Table 19). The experimental site was fallow in 1993. Highest yielding varieties were Westbred Rambo, Newana, and Klasic. Average yield was 55.0 bu/acre. Relative yields, test weights, and proteins for five years are shown in Tables 20 through 22.

Valley County: Irrigated, cooperators: Kelly Donovan

Nineteen spring wheat varieties were tested (Table 23). Highest yielding varieties were McNeal, Dalen, and Sonja. Average yield was 75.7 bu/acre. Relative yields, test weights, and proteins over five years are shown in Tables 24 through 26.

Durum

Roosevelt County: Dryland, cooperators: Mark Swank

Eight durum varieties were tested (Table 27). Experimental site was fallow in 1993. Plenty, Renville, and Ward yielded most. Average yield was 50.1 bu/acre. Five year summaries for yield, test weight, and protein are shown in Tables 28 through 30.

Sheridan County: Dryland, cooperators: Max Aasheim

Eight durum varieties were tested at this site (Table 31). The experimental site was fallow in 1993. Plenty, Kyle, and Renville yielded the most. Average yield at this site was 58.2 bu/acre. Relative yields, test weights, and proteins for five years are shown in Tables 32 through 34.

Sheridan County: Irrigated, cooperators: Steve Brekke

The 1994 plots were abandoned due to severe weed infestation. Five year summaries for yield, test weight, and protein for the 1989-1993 period are shown in Tables 35 through 37.

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 counties. Soil moisture and rainfall were generally good in eastern Montana, so that yields were greater than normal in some sites.

FUTURE PLANS: New varieties will continue to be evaluated and compared with existing varieties at these off-station sites.

Table 1. Agronomic data collected from an off-station dryland spring wheat yield trial grown in McCone County in cooperation with the MSU Extension Service. Cooperator: Victor Wagner.
Planted: 20 April 1994 Harvested: 12 August 1994

Cultivar	protein content	test weight lb/bu	yield bu/acre
Pioneer 2375	9.8	63.7	35.1a
Lew	10.0	62.9	33.1
Amidon	10.7	62.5	32.1
McNeal	10.0	62.2	32.0
Gus	10.5	62.9	31.7
ND 677	10.8	64.2	30.8
Westbred Rambo	9.9	64.3	30.7
Kulm	11.7	64.2	30.2
Stoa	10.0	62.8	29.5
Dalen	10.2	65.1	29.0
Newana	9.9	63.9	27.8
Bergen	11.1	63.4	27.6
Sonja	10.1	62.7	26.2
Grandin	10.3	63.8	25.4
Pondera	10.7	63.5	25.0
Border	11.6	63.3	21.1x
Hi-Line	11.2	64.3	20.6x
Klasic	11.1	64.0	17.6xx
mean	10.5	63.5	28.1
F-ratio	4.95**	5.00**	4.24**
CV (S/mean)	4.51	0.94	14.1
CV (SE/mean)	2.60	0.54	8.14
LSD 0.05	0.79	0.99	6.57
LSD 0.01	1.06	1.33	8.82

** indicates significant difference among cultivars at $p < 0.01$

a indicates significantly greater yield than check cultivar, Newana at $p < 0.05$

x indicates significantly lower yield than check cultivar, Newana at $p < 0.05$

xx indicates significantly lower yield than check cultivar, Newana at $p < 0.01$

Table 2. Relative yields of spring wheat cultivars grown in dryland off-station nurseries in McCone County in cooperation with MAES. Cooperator: Victor Wagner

Cultivar	# of Years	1990	1991	1992	1993	1994	Ave	as % of Newana
Amidon	5	20.2	32.6	57.5	40.8	32.1	36.6	123.0
Lew	5	17.5	28.0	55.9	38.5	33.1	34.6	116.2
McNeal	3	--	--	46.2	48.7	32.0	42.3	116.0
Stoa	4	18.9	25.0	--	41.2	29.5	28.6	112.0
ND 677	1	--	--	--	--	30.8	30.8	110.8
Kulm	1	--	--	--	--	30.2	30.2	108.6
Grandin	4	22.0	22.1	--	39.9	25.4	27.4	106.9
Westbred Rambo	5	12.9	29.2	50.0	35.8	30.7	31.7	106.5
Gus	3	17.2	21.6	--	--	31.7	23.5	104.8
Dalen	3	--	--	44.7	40.1	29.0	37.9	104.0
Pioneer 2375	4	--	22.6	41.7	38.6	35.1	34.5	103.0
Westbred 926	3	12.2	23.7	51.1	--	--	29.0	101.0
Newana	5	14.9	24.6	46.6	35.0	27.8	29.8	100.0
Sonja	1	--	--	--	--	26.2	26.2	94.2
Pondera	5	12.1	20.5	40.5	37.4	25.0	27.1	91.0
Bergen	2	--	--	37.9	--	27.6	32.8	88.0
Hi-Line	5	15.9	20.3	38.1	32.8	20.6	25.5	85.8
Border	1	--	--	--	--	21.1	21.1	75.9
Klasic	1	--	--	--	--	17.6	17.6	63.3

Table 3. Relative test weights of spring wheat cultivars grown in dryland off-station nurseries in McCone County in cooperation with MAES. Cooperator: Victor Wagner.

Cultivar	# of Years	1990	1991	1992	1993	1994	Ave	as % of Newana
Dalen	3	--	--	62.4	60.4	65.1	62.6	102.1
Westbred Rambo	5	64.7	61.0	63.9	60.0	64.3	62.8	101.6
Grandin	4	64.2	60.8	--	61.1	63.8	62.5	101.0
Kulm	1	--	--	--	--	64.2	64.2	100.9
ND 677	1	--	--	--	--	64.2	64.2	100.9
Lew	5	64.2	60.8	62.3	60.8	62.9	62.2	100.7
Pioneer 2375	4	--	59.6	61.9	59.9	63.8	61.3	100.5
McNeal	3	--	--	61.7	60.6	62.2	61.5	100.2
Klasic	1	--	--	--	--	64.0	64.0	100.2
Newana	5	64.9	59.9	61.5	58.7	63.9	61.8	100.0
Pondera	5	63.5	60.3	61.6	60.0	63.5	61.8	100.0
Stoa	4	64.2	61.0	--	58.8	62.8	61.7	99.8
Gus	3	64.0	61.2	--	--	62.9	62.7	99.7
Westbred 926	3	62.6	59.6	63.2	--	--	61.8	99.5
Hi-Line	5	62.6	60.3	62.1	57.9	64.3	61.4	99.4
Amidon	5	63.5	59.0	62.4	59.3	62.5	61.3	99.3
Border	1	--	--	--	--	63.3	63.3	99.1
Bergen	2	--	--	60.5	--	63.4	62.0	98.8

Table 4. Relative protein contents of spring wheat cultivars grown in dryland off-station nurseries in McCone County in cooperation with MAES.

Cooperator: Victor Wagner.

Cultivar	# of Years	1990	1991	1992	1993	1994	Ave	as % of Newana
Kulm	1	--	--	--	--	11.7	11.7	118.2
Border	1	--	--	--	--	11.6	11.6	117.2
Bergen	2	--	--	14.9	--	11.1	13.0	117.1
Hi-Line	5	17.6	16.2	14.4	15.9	11.2	15.1	113.9
Klasic	1	--	--	--	--	11.1	11.1	112.1
Grandin	4	16.9	16.4	--	16.0	10.3	14.9	110.8
Westbred 926	3	17.7	15.1	13.8	--	--	15.5	110.4
Dalen	3	--	--	14.3	15.4	10.2	13.3	109.6
ND 677	1	--	--	--	--	10.8	10.8	109.1
Gus	3	16.5	16.4	--	--	10.5	14.5	109.0
Pondera	5	16.9	15.1	14.1	15.0	10.7	14.4	108.6
Pioneer 2375	3	--	15.7	14.2	15.0	9.8	13.7	108.5
Stoa	4	15.2	15.4	--	16.2	10.0	14.2	105.6
Amidon	5	15.8	15.3	13.0	14.4	10.7	13.8	104.7
McNeal	3	--	--	11.8	15.4	10.0	12.4	102.8
Westbred Rambo	5	15.5	14.5	13.0	14.7	9.9	13.5	102.3
Sonja	1	--	--	--	--	10.1	10.1	102.0
Lew	5	15.2	15.1	12.4	14.6	10.0	13.5	101.8
Newana	5	15.7	14.2	12.3	14.0	9.9	13.2	100.0

Table 5. Relative yields of spring wheat cultivars grown in dryland off-station nurseries in Wibaux County in cooperation with MAES.
Cooperator: David Maus

Cultivar	# of Years	1987	1989	1991	1992	1993	Ave	as % of Newana
Krona	1	--	--	--	--	37.1	37.1	123.2
Amidon	5	34.4	43.1	25.6	71.9	33.2	41.6	111.1
Grandin	4	41.4	36.9	20.3	--	33.9	33.1	109.3
Pioneer 2375	3	--	--	32.8	53.9	40.5	42.4	108.7
Stoa	4	36.1	40.8	20.4	--	33.9	32.8	108.3
McNeal	2	--	--	--	59.1	44.3	51.7	107.4
Olaf	2	--	39.1	21.3	--	--	30.2	107.3
Glenman	4	41.3	37.6	19.2	68.3	--	41.6	105.8
Newana	5	34.8	35.6	20.7	66.2	30.1	37.5	100.0
Westbred Rambo	5	36.1	35.0	17.9	63.2	33.3	37.1	99.0
Lew	5	30.9	36.0	21.3	54.9	36.5	35.9	95.8
Pondera	5	29.2	38.3	18.6	55.3	32.6	34.8	92.8
Hi-Line	4	--	37.0	17.3	47.6	35.1	34.2	89.8
Dalen	2	--	--	--	50.0	27.0	38.5	80.0
Westbred 926	2	--	--	19.1	50.1	--	34.6	79.6

Table 6. Relative test weights of spring wheat cultivars grown in dryland off-station nurseries in Wibaux County in cooperation with MAES.
Cooperator: David Maus

Cultivar	# of Years	1987	1989	1991	1992	1993	Ave	as % of Newana
Pondera	5	61.5	63.5	58.0	63.9	62.8	61.9	102.7
Dalen	2	--	--	--	64.4	63.3	63.8	102.4
Lew	5	59.5	63.5	57.8	63.6	62.8	61.4	101.9
Westbred Rambo	5	60.5	63.0	57.6	63.8	60.7	61.1	101.4
Amidon	5	58.5	62.5	58.7	62.4	63.0	61.0	101.2
Grandin	4	60.0	62.0	56.9	--	62.3	60.3	101.2
Pioneer 2375	3	--	--	57.0	63.4	61.3	60.6	100.9
Olaf	2	--	62.5	56.9	--	--	59.7	100.9
Stoa	4	60.8	63.0	55.8	--	60.5	60.0	100.8
Newana	5	58.5	63.0	55.3	63.2	61.5	60.3	100.0
Krona	1	--	--	--	--	61.4	61.4	99.8
Glenman	4	60.1	62.0	55.1	61.8	--	59.8	99.6
Westbred 926	2	--	--	54.8	63.1	--	59.0	99.5
McNeal	2	--	--	--	62.0	61.2	61.6	99.1
Hi-Line	4	--	61.5	54.2	63.1	60.6	59.8	98.5

Table 7. Relative protein concentrations of spring wheat cultivars grown in dryland off-station nurseries in Wibaux County in cooperation with MAES. Cooperator: David Maus

Cultivar	# of Years	1987	1989	1991	1992	1993	Ave	as % of Newana
Dalen	2	--	--	--	15.8	13.2	14.5	115.1
Hi-Line	4	--	14.7	18.3	14.6	13.2	15.2	113.0
Krona	1	--	--	--	--	12.4	12.4	112.7
Grandin	4	15.7	15.5	17.6	--	12.8	15.4	112.2
Olaf	2	--	13.0	17.7	--	--	15.4	107.3
Westbred 926	2	--	--	17.7	15.2	--	16.4	106.8
Stoa	4	16.0	12.7	18.0	--	11.8	14.6	106.6
McNeal	2	--	--	--	14.8	12.0	13.4	106.3
Pioneer 2375	3	--	--	17.2	14.6	12.6	14.8	106.2
Lew	5	15.4	13.1	18.0	14.4	12.2	14.6	105.8
Pondera	5	15.9	12.7	17.4	14.2	12.5	14.5	105.2
Westbred Rambo	5	15.1	12.9	18.1	13.2	12.2	14.3	103.5
Amidon	5	15.5	12.5	16.8	14.2	11.6	14.1	102.2
Newana	5	15.3	12.0	16.6	14.2	11.0	13.8	100.0
Glenman	4	14.1	11.6	17.0	12.6	--	13.8	95.2

Table 8. Agronomic data collected from an off-station dryland spring wheat yield trial grown in Roosevelt County in cooperation with the MSU Extension Service. Cooperator: Mark Swank
 Planted: 19 April 1994 Harvested: 9 August 1994

Cultivar	protein content	test weight lb/bu	yield bu/acre
Pioneer 2375	11.6	62.4	55.1
Sonja	11.7	61.2	54.5
Bergen	12.0	61.9	53.3
Amidon	11.4	62.0	52.5
Klasic	11.4	62.4	51.5
Dalen	11.7	62.4	51.0
McNeal	11.3	61.2	50.9
Gus	12.3	61.4	50.7
Newana	11.2	60.9	49.2
Hi-Line	11.8	61.5	48.7
Stoa	12.1	60.9	46.8
Lew	11.9	62.5	46.3
Grandin	11.7	61.6	46.2
ND 677	12.1	63.4	45.5
Kulm	12.5	63.2	45.4
Border	11.6	61.8	42.9
Westbred Rambo	11.6	60.9	42.7
Pondera	11.5	61.5	40.5x

mean	11.7	61.8	48.5
F-ratio	3.93**	4.90**	3.50**
CV (S/mean)	2.66	0.96	8.08
CV (SE/mean)	1.53	0.55	4.67
LSD 0.05	0.52	0.98	6.51
LSD 0.01	0.70	1.32	8.74

**indicates significant difference among cultivars at probability < 0.01

x indicates significantly lower yield than check cultivar, Newana, at p < 0.05

Table 9. Relative yields of spring wheat cultivars grown in dryland off-station nurseries in Roosevelt County in cooperation with MAES.

Cooperator: Mark Swank.

Cultivar	# of Years	1989	1990	1992	1993	1994	Ave	as % of Newana
Sonja	1	--	--	--	--	54.5	54.5	110.8
McNeal	3	--	--	58.3	61.5	50.9	56.9	108.8
Amidon	5	25.3	26.5	58.9	55.1	52.5	43.7	108.3
Klasic	1	--	--	--	--	51.5	51.5	104.7
Grandin	4	23.8	25.6	--	59.4	46.2	38.8	103.7
Newana	5	21.4	23.2	52.1	55.6	49.2	40.3	100.0
Gus	3	21.3	21.7	--	--	50.7	31.2	99.9
Pioneer 2375	3	--	--	44.3	54.2	55.1	51.2	97.9
Stoa	4	20.9	23.5	--	53.4	46.8	36.2	96.8
Lew	5	24.1	23.0	54.4	46.7	46.3	38.9	96.5
Hi-Line	5	24.7	23.8	44.1	51.8	48.7	38.6	95.8
Dalen	3	--	--	50.8	47.7	51.0	49.8	95.3
ND 677	1	--	--	--	--	45.5	45.5	92.5
Pondera	5	25.7	24.9	44.1	51.0	40.5	37.2	92.4
Kulm	1	--	--	--	--	45.4	45.4	92.3
Westbred Rambo	5	21.8	23.1	47.2	46.5	42.7	36.3	90.0
Bergen	2	--	--	37.6	--	53.3	45.4	89.7
Border	1	--	--	--	--	42.9	42.9	87.2

Table 10. Relative test weights of spring wheat cultivars grown in dryland off-station nurseries in Roosevelt County in cooperation with MAES.

Cooperator: Mark Swank.

Cultivar	# of Years	1989	1990	1992	1993	1994	Ave	as % of Newana
ND 677	1	--	--	--	--	63.4	63.4	104.1
Kulm	1	--	--	--	--	63.2	63.2	103.8
Klasic	1	--	--	--	--	62.4	62.4	102.5
Dalen	3	--	--	65.0	60.9	62.4	62.8	102.3
Pioneer 2375	3	--	--	64.0	60.7	62.4	62.4	101.7
Border	1	--	--	--	--	61.8	61.8	101.5
Grandin	4	62.1	59.4	--	61.1	61.6	61.0	101.1
Westbred Rambo	5	63.2	60.6	64.2	59.7	60.9	61.7	101.0
Lew	5	61.1	58.5	64.5	61.4	62.5	61.6	100.8
McNeal	3	--	--	63.3	61.0	61.2	61.8	100.8
Sonja	1	--	--	--	--	61.2	61.2	100.5
Amidon	5	62.7	58.3	63.1	60.7	62.0	61.4	100.4
Pondera	5	62.7	59.2	63.3	60.1	61.5	61.4	100.4
Bergen	2	--	--	63.6	--	61.9	62.8	100.3
Newana	5	62.0	59.6	64.0	59.1	60.9	61.1	100.0
Stoa	4	61.0	58.5	--	60.5	60.9	60.2	99.7
Gus	3	61.1	59.0	--	--	61.4	60.5	99.5
Hi-Line	5	60.6	57.1	64.2	59.8	61.5	60.6	99.2

Table 11. Relative protein contents of spring wheat cultivars grown in dryland off-station nurseries in Roosevelt County in cooperation with MAES. Cooperator: Mark Swank.

Cultivar	# of Years	1989	1990	1992	1993	1994	Ave	as % of Newana
Dalen	3	--	--	14.6	14.2	11.7	13.5	112.8
Gus	3	16.0	18.2	--	--	12.3	15.5	111.8
Kulm	1	--	--	--	--	12.5	12.5	111.6
Stoa	4	15.5	17.2	--	14.6	12.1	14.8	110.8
Hi-Line	5	15.0	17.7	14.7	14.2	11.8	14.07	110.7
Bergen	2	--	--	14.3	--	12.0	13.2	110.0
Grandin	4	15.7	17.3	--	13.7	11.7	14.6	109.0
Pondera	5	15.2	17.8	13.8	13.6	11.5	14.4	108.4
Pioneer 2375	3	--	--	14.0	13.2	11.6	12.9	108.1
ND 677	1	--	--	--	--	12.1	12.1	108.0
Lew	5	14.4	17.8	13.0	14.0	11.9	14.2	107.2
Amidon	5	14.1	17.3	14.0	14.2	11.4	14.2	107.1
McNeal	3	--	--	13.2	13.5	11.3	12.7	105.8
Westbred Rambo	5	15.1	16.5	12.7	14.1	11.6	14.0	105.6
Sonja	1	--	--	--	--	11.7	11.7	104.5
Border	1	--	--	--	--	11.6	11.6	103.6
Klasic	1	--	--	--	--	11.4	11.4	101.8
Newana	5	14.0	16.4	12.7	12.0	11.2	13.3	100.0

Table 12. Agronomic data collected from an off-station dryland spring wheat yield trial grown in Sheridan County in cooperation with MSU Extension Service. Cooperator: Max Aasheim Planted: 22 April 1994 Harvested: 10 August 1994

Cultivar	protein content	test weight lb/bu	yield bu/acre
Sonja	14.2	60.0	61.0a
Bergen	13.5	60.1	59.7a
McNeal	12.8	60.5	58.2
Pioneer 2375	12.4	61.8	58.0
Stoa	14.2	60.0	57.6
Dalen	12.0	61.4	55.0
Border	13.6	61.6	54.4
Amidon	14.0	59.9	54.0
ND 677	13.9	62.2	52.2
Hi-Line	12.7	61.4	51.8
Newana	12.8	59.1	51.4
Lew	13.9	60.0	51.4
Kulm	13.5	63.4	51.1
Grandin	12.2	60.5	49.0
Pondera	13.2	60.0	48.4
Klasic	12.8	64.0	47.8
Gus	14.8	59.8	47.4
Westbred Rambo	12.5	59.4	47.2

mean	13.3	60.8	53.1
F-ratio	4.64**	7.64**	2.50**
CV (S/mean)	4.84	1.39	9.07
CV (SE/mean)	2.80	0.80	5.24
LSD 0.05	1.07	1.40	8.00
LSD 0.01	1.43	1.88	10.7

** indicates dignificant difference among cultivars at p < 0.01
a indicates significantly greater yield than check cultivar, Newana, at p < 0.05

Table 13. Relative yields of spring wheat cultivars grown in dryland off-station yield trials in Sheridan County in cooperation with MAES. Cooperator: Max Aasheim

Cultivar	# of Years	1989	1991	1992	1993	1994	Ave	as % of Newana
Sonja	1	--	--	--	--	61.0	61.0	118.7
Grandin	4	23.9	25.4	--	48.6	49.0	36.7	116.9
McNeal	3	--	--	38.3	31.7	58.2	42.7	110.6
Stoa	4	20.9	30.2	--	27.5	57.6	34.0	108.4
Westbred Rambo	5	20.1	31.4	41.7	37.2	47.2	35.5	108.3
Border	1	--	--	--	--	54.4	54.4	105.8
ND 677	1	--	--	--	--	52.2	52.2	101.6
Lew	5	21.6	32.0	36.5	24.7	51.4	33.2	101.3
Amidon	5	19.1	29.3	35.2	27.8	54.0	33.1	100.9
Newana	5	19.3	28.8	38.3	26.2	51.4	32.8	100.0
Kulm	1	--	--	--	--	51.1	51.1	99.4
Gus	3	22.0	28.5	--	--	47.4	32.6	98.4
Bergen	2	--	--	27.9	--	59.7	43.8	97.7
Pioneer 2375	4	--	35.4	18.3	26.6	58.0	34.6	95.6
Hi-Line	5	22.7	30.5	30.9	18.7	51.8	30.9	94.3
Klasic	1	--	--	--	--	47.8	47.8	93.0
Pondera	5	17.9	26.8	34.3	23.8	48.4	30.2	92.2
Dalen	3	--	--	23.6	26.5	55.0	35.0	90.7

Table 14. Relative test weights of spring wheat cultivars grown in dryland off-station yield trials in Sheridan County in cooperation with MAES. Cooperator: Max Aasheim.

Cultivar	# of Years	1989	1991	1992	1993	1994	Ave	as % of Newana
Klasic	1	--	--	--	--	64.0	64.0	108.3
Kulm	1	--	--	--	--	63.4	63.4	107.3
ND 677	1	--	--	--	--	62.2	62.2	105.2
Border	1	--	--	--	--	61.6	61.6	104.2
Dalen	3	--	--	62.8	62.3	61.4	62.2	102.8
Sonja	1	--	--	--	--	60.0	60.0	101.5
Pioneer 2375	4	--	63.3	61.1	61.2	61.8	61.8	101.3
Lew	5	60.5	63.1	63.1	62.7	60.0	61.9	101.0
Westbred Rambo	5	62.6	63.5	62.4	60.3	59.4	61.6	100.7
Grandin	4	60.6	63.3	--	61.1	60.5	61.4	100.4
McNeal	3	--	--	60.6	61.0	60.5	60.7	100.3
Amidon	5	61.2	63.1	60.8	61.7	59.9	61.3	100.2
Pondera	5	61.3	62.4	61.8	61.3	60.0	61.4	100.2
Stoa	4	61.2	63.1	--	60.4	60.0	61.2	100.1
Newana	5	61.9	62.8	61.7	60.7	59.1	61.2	100.0
Bergen	2	--	--	60.5	--	60.1	60.3	99.8
Hi-Line	5	59.1	63.1	61.6	60.0	61.4	61.0	99.7
Gus	3	59.8	62.2	--	--	59.8	60.6	98.9

Table 15. Relative protein contents of spring wheat cultivars grown in dryland off-station yield trials in Sheridan County in cooperation with MAES.
Cooperator: Max Aasheim.

Cultivar	# of Years	1989	1991	1992	1993	1994	Ave	as % of Newana
Gus	3	15.1	14.5	--	--	14.8	14.8	113.0
Sonja	1	--	--	--	--	14.2	14.2	110.9
Hi-Line	5	16.0	13.8	13.6	14.6	12.7	14.1	108.9
Dalen	3	--	--	14.6	15.2	12.0	13.9	108.9
ND 677	1	--	--	--	--	13.9	13.9	108.6
Stoa	4	14.7	13.5	--	13.6	14.2	14.0	108.3
Pondera	5	14.7	13.8	13.4	14.2	13.2	13.9	106.8
Amidon	5	14.2	13.6	13.4	14.0	14.0	13.8	106.6
Border	1	--	--	--	--	13.6	13.6	106.2
Lew	5	13.9	13.5	13.3	14.0	13.9	13.7	105.7
Kulm	1	--	--	--	--	13.5	13.5	105.5
Westbred Rambo	5	14.4	13.6	12.8	14.4	12.5	13.5	104.3
Bergen	2	--	--	13.6	--	13.5	13.6	104.2
Grandin	4	15.0	13.6	--	13.7	12.2	13.6	103.4
McNeal	3	--	--	13.9	12.8	12.8	13.2	102.9
Pioneer 2375	4	--	13.5	13.0	13.0	12.4	13.0	100.8
Newana	5	13.4	13.1	13.2	12.4	12.8	13.0	100.0
Klasic	1	--	--	--	--	12.8	12.8	100.0

Table 16. Relative yields of spring wheat cultivars grown in irrigated off-station yield trials in Sheridan County in cooperation with MAES.
Cooperator: Steve Brekke.

Cultivar	# of Years	1989	1990	1991	1992	1993	Ave	as % of Newana
Dalen	1	--	--	--	--	86.6	86.6	119.4
Westbred 936	1	--	--	--	95.5	--	95.5	114.2
McNeal	2	--	--	--	93.9	79.5	86.7	111.1
Amidon	5	71.5	60.5	38.4	82.5	91.3	68.8	110.7
Bergen	2	--	--	--	94.5	78.3	86.4	110.7
Pioneer 2375	2	--	--	37.8	--	80.3	59.0	110.7
Probrand 751	2	63.6	--	--	98.8	--	81.2	110.6
Sonja	1	--	--	--	--	77.0	77.0	106.2
Grandin	4	68.8	51.1	38.8	--	69.9	57.2	100.5
Newana	5	63.3	57.4	34.2	83.6	72.5	62.2	100.0
Hi-Line	5	55.6	52.1	37.4	90.2	69.9	61.0	98.1
Pondera	5	52.1	58.9	41.3	73.3	72.2	59.6	95.8
Gus	4	--	49.0	42.8	80.3	64.1	59.0	95.4
Westbred Rambo	4	70.2	44.8	34.1	74.6	--	55.9	93.8
Krona	1	--	--	--	--	65.7	65.7	90.6

Table 17. Relative test weights of spring wheat cultivars grown in irrigated off-station yield trials in Sheridan County in cooperation with MAES.
Cooperator: Steve Brekke.

Cultivar	# of Years	1989	1990	1991	1992	1993	Ave	as % of Newana
Pioneer 2375	2	--	--	58.7	--	60.7	59.7	105.6
Sonja	1	--	--	--	--	60.2	60.2	104.5
Grandin	4	62.0	60.0	58.5	--	59.8	60.1	103.1
Dalen	1	--	--	--	--	59.3	59.3	103.0
McNeal	2	--	--	--	59.7	60.1	59.9	102.5
Gus	4	--	59.0	56.4	59.2	59.7	58.6	101.5
Hi-Line	5	62.0	60.0	58.5	58.2	57.9	59.3	101.4
Westbred Rambo	4	61.8	58.0	56.4	60.5	--	59.2	100.8
Pondera	5	61.5	59.0	56.0	57.8	59.6	58.8	100.5
Amidon	5	60.0	58.0	57.1	59.0	59.5	58.7	100.4
Bergen	2	--	--	--	58.3	59.0	58.6	100.3
Newana	5	61.5	58.5	55.5	59.3	57.6	58.5	100.0
Krona	1	--	--	--	--	57.6	57.6	100.0
Westbred 936	1	--	--	--	57.8	--	57.8	97.5
Probrand 751	2	60.7	--	--	56.8	--	58.8	97.3

Table 18. Relative protein contents of spring wheat cultivars grown in irrigated off-station yield trials in Sheridan County in cooperation with MAES.
Cooperator: Steve Brekke.

Cultivar	# of Years	1989	1990	1991	1992	1993	Ave	as % of Newana
Westbred 936	1	--	--	--	13.9	--	13.9	114.9
Gus	4	--	16.2	14.4	13.8	15.9	15.2	112.7
Hi-Line	5	12.3	14.6	14.8	12.8	14.8	13.9	107.8
Probrand 751	2	10.3	--	--	14.2	--	12.2	107.0
Sonja	1	--	--	--	--	15.2	15.2	107.0
Grandin	3	--	14.8	14.2	--	15.0	14.7	106.3
Amidon	5	11.2	15.0	13.8	13.1	15.0	13.6	105.9
Dalen	1	--	--	--	--	14.7	14.7	103.5
Westbred Rambo	4	11.2	14.3	14.8	11.3	--	12.9	103.0
Pondera	5	11.6	14.7	14.0	11.6	14.2	13.2	102.8
Krona	1	--	--	--	--	14.6	14.6	102.8
Newana	5	10.8	13.6	13.6	12.1	14.2	12.9	100.0
Pioneer 2375	2	--	--	12.8	--	14.1	13.4	96.8
Bergen	2	--	--	--	11.5	13.6	12.6	95.4
McNeal	2	--	--	--	10.8	14.8	12.8	89.7

Table 19. Agronomic data collected from an off-station dryland spring wheat yield trial grown in Valley County in cooperation with MSU Extension Service. Cooperator: Bill Lauckner. Planted: 25 April 1994 Harvested: 6 August 1994

Cultivar	protein content	test weight lb/bu	yield bu/acre
Westbred Rambo	13.7	62.3	64.8
Newana	13.9	59.6	61.3
Klasic	14.0	60.7	60.8
Sonja	14.0	58.9	60.6
McNeal	15.0	58.3	60.0
Dalen	14.1	61.4	58.7
Stoa	14.9	59.7	56.0
Lew	13.8	61.9	54.8
Bergen	13.1	61.3	54.6
Pondera	14.1	62.5	54.0
Gus	14.5	61.4	53.9
Tioga	14.2	61.5	53.1
Kulm	14.5	63.8	52.8
ND 677	14.7	63.2	52.8
Pioneer 2375	13.7	60.6	52.4
Amidon	14.2	62.1	51.4
Border	13.7	59.3	50.1
Hi-Line	15.6	58.4	48.0
Grandin	14.8	60.2	45.9

mean	14.2	60.9	55.0
F-ratio	1.47	7.22**	1.06
CV (S/mean)	5.93	1.67	15.0
CV (SE/mean)	3.42	0.96	8.67
LSD 0.05	NS	1.68	NS
LSD 0.01		2.26	

** indicates significant difference among cultivars at p < 0.01

NS indicates no significant difference among cultivars

Table 20. Relative yields of spring wheat cultivars grown in dryland off-station yield trials in Valley County in cooperation with MAES.
 Cooperator: Bill Lauckner

Variety	# of Years	1990	1991	1992	1993	1994	Ave	as % of Newana
McNeal	3	--	--	55.6	58.7	60.0	58.1	117.8
Westbred 926	3	21.6	42.7	37.5	--	--	33.9	106.6
Grandin	4	17.6	39.1	--	45.3	45.9	37.0	105.6
Amidon	5	19.6	32.8	51.2	45.1	51.4	40.0	101.3
Pioneer 2375	4	--	38.1	52.2	42.8	52.4	46.4	104.1
Stoa	4	17.1	29.5	--	38.3	56.0	35.2	100.6
Newana	5	13.6	30.2	51.7	35.0	61.3	38.4	100.0
Westbred Rambo	5	16.0	31.6	41.5	36.3	64.8	38.0	99.2
Dalen	3	--	--	49.7	38.4	58.7	48.9	99.2
Klasic	1	--	--	--	--	60.8	60.8	99.2
Hi-Line	5	18.4	37.5	49.9	36.3	48.0	38.0	99.1
Sonja	1	--	--	--	--	60.6	60.6	98.9
Pondera	5	15.7	35.4	45.0	37.1	54.0	37.4	97.6
Lew	5	16.5	28.0	49.5	36.4	54.8	37.0	96.6
Gus	3	16.3	30.8	--	--	53.9	33.7	96.1
Bergen	2	--	--	43.5	--	54.6	49.0	86.8
Tioga	1	--	--	--	--	53.1	53.1	86.6
Kulm	1	--	--	--	--	52.8	52.8	86.1
ND 677	1	--	--	--	--	52.8	52.8	86.1
Border	1	--	--	--	--	50.1	50.1	81.7

Table 21. Relative test weights of spring wheat cultivars grown in dryland off-station yield trials in Valley County in cooperation with MAES. Cooperator: Bill Lauckner.

Variety	# of Years	1990	1991	1992	1993	1994	Ave	as % of Newana
Kulm	1	--	--	--	--	63.8	63.8	107.0
ND 677	1	--	--	--	--	63.2	63.2	106.0
Tioga	1	--	--	--	--	61.5	61.5	103.2
Westbred Rambo	5	62.2	62.6	64.7	58.1	62.3	62.0	102.9
Gus	3	61.7	62.2	--	--	61.4	61.8	102.9
Dalen	3	--	--	65.4	59.2	61.4	62.0	102.9
Lew	5	60.8	63.3	63.7	58.7	61.9	61.7	102.4
Pondera	5	61.9	60.5	64.4	57.9	62.5	61.4	102.0
Klasic	1	--	--	--	--	60.7	60.7	101.8
Amidon	5	61.0	60.5	64.2	58.5	62.1	61.3	101.7
Stoa	4	62.2	62.4	--	56.5	59.7	60.2	101.7
Pioneer 2375	4	--	62.0	64.8	57.7	60.6	61.3	101.5
Grandin	4	61.0	59.0	--	60.0	60.2	60.0	101.4
Bergen	2	--	--	63.8	--	61.3	62.6	101.0
McNeal	3	--	--	63.2	59.4	58.3	60.3	100.1
Newana	5	59.6	60.8	64.3	56.8	59.6	60.2	100.0
Hi-Line	5	60.6	59.5	64.7	57.1	58.4	60.1	99.7
Border	1	--	--	--	--	59.3	59.3	99.5
Westbred 926	3	60.6	59.0	63.5	--	--	61.0	99.1
Sonja	1	--	--	--	--	58.9	58.9	98.8

Table 22. Relative protein concentrations of spring wheat cultivars grown in dry-land off-station yield trials in Valley County in cooperation with MAES. Cooperator: Bill Lauckner.

Variety	# of Years	1990	1991	1992	1993	1994	Ave	as % of Newana
Dalen	3	--	--	15.9	16.4	14.1	15.5	106.7
Gus	3	18.3	17.3	--	--	14.5	16.7	106.1
Hi-Line	5	18.5	16.7	16.0	14.5	15.6	16.3	105.9
Pondera	5	19.0	16.5	15.9	15.8	14.1	16.3	105.9
ND 677	1	--	--	--	--	14.7	14.7	105.8
Stoa	4	17.8	16.5	--	16.4	14.9	16.4	105.6
McNeal	3	--	--	15.5	15.4	15.0	15.3	105.5
Grandin	4	17.9	16.9	--	15.8	14.8	16.4	105.3
Westbred 926	3	17.8	16.3	16.2	--	--	16.8	104.8
Kulm	1	--	--	--	--	14.5	14.5	104.3
Lew	5	18.3	17.2	14.8	15.5	13.8	15.9	103.6
Amidon	5	18.6	16.3	14.8	15.3	14.2	15.8	103.1
Westbred Rambo	5	17.9	16.3	15.4	15.4	13.7	15.7	102.5
Tioga	1	--	--	--	--	14.2	14.2	102.2
Klasic	1	--	--	--	--	14.0	14.0	100.7
Sonja	1	--	--	--	--	14.0	14.0	100.7
Pioneer 2375	4	--	16.3	15.4	14.6	13.7	15.0	100.5
Bergen	2	--	--	15.6	--	13.1	14.4	100.3
Newana	5	17.1	16.2	14.7	14.9	13.9	15.4	100.0
Border	1	--	--	--	--	13.7	13.7	98.6

Table 23. Agronomic data collected from an off-station irrigated spring wheat yield trial grown in Valley County in cooperation with MSU Extension Service. Cooperator: Kelly Donovan. Planted: 25 April 1994 Harvested: 19 August 1994

Cultivar	protein content	test weight lb/bu	yield bu/acre
McNeal	15.2	63.2	89.9
Dalen	15.6	65.0	87.6
Sonja	15.3	63.9	85.9
Hi-Line	14.7	64.4	81.3
Westbred Rambo	14.1	64.7	81.0
Newana	14.2	63.6	80.7
Bergen	14.8	63.3	79.6
Stoa	15.9	63.8	78.2
Probrand 751	13.6	62.7	77.6
Gus	16.0	63.2	75.5
Lew	14.5	64.9	75.5
Amidon	15.3	63.3	74.4
Pioneer 2375	15.3	64.8	74.0
Grandin	15.1	63.8	73.3
Pondera	14.9	63.2	67.6
Klasic	14.9	63.6	66.7
Kulm	17.7	63.7	66.3
Border	15.4	63.8	62.0x
ND 677	17.2	64.1	61.1x

mean	15.2	63.8	75.7
F-ratio	18.5**	6.14**	2.10*
CV (S/mean)	2.58	0.70	12.9
CV (SE/mean)	1.49	0.40	7.45
LSD 0.05	0.65	0.74	16.2
LSD 0.01	0.87	0.99	NS

* indicates significant difference among cultivars at $p < 0.05$

** indicates significant difference among cultivars at $p < 0.01$

x indicates significantly lower yield than check cultivar, Newana, at $p < 0.05$

NS indicates no significant difference among cultivars at $p < 0.01$

Table 24. Relative yields of spring wheat cultivars grown in irrigated off-station yield trials in Valley County in cooperation with MAES.
Cooperator: Kelly Donovan.

Variety	# of Years	1990	1991	1992	1993	1994	Ave	as % of Newana
Sonja	2	--	--	--	81.8	85.9	83.8	120.0
Pioneer 2375	3	--	72.9	--	71.8	74.0	72.9	119.6
Hi-Line	5	56.1	61.6	61.1	61.4	81.3	64.3	113.1
Stoa	3	41.7	59.3	--	--	78.2	59.7	109.0
Lew	3	48.8	53.7	--	--	75.5	59.3	108.3
McNeal	3	--	--	61.5	64.3	89.9	71.9	107.5
Dalen	2	--	--	--	61.6	87.6	74.6	106.8
Westbred 926	3	36.8	58.4	58.5	--	--	51.2	106.3
Amidon	5	42.5	56.0	60.9	61.8	74.4	59.1	104.0
Gus	5	53.7	59.1	52.3	55.0	75.5	59.1	104.0
Grandin	4	40.5	45.8	--	68.9	73.3	57.1	102.3
Bergen	3	--	--	66.7	58.6	79.6	68.3	102.1
Westbred Rambo	4	45.6	47.0	54.6	--	81.0	57.0	101.3
Newana	5	40.6	43.1	60.9	59.0	80.7	56.9	100.0
Probrand 751	2	--	--	59.6	--	77.6	68.6	96.9
Pondera	5	32.6	52.3	54.5	58.8	67.6	53.2	93.5
Klasic	1	--	--	--	--	66.7	66.7	82.7
Kulm	1	--	--	--	--	66.3	66.3	82.1
Border	1	--	--	--	--	62.0	62.0	76.8
ND 677	1	--	--	--	--	61.1	61.1	75.7

Table 25. Relative test weights of spring wheat cultivars grown in irrigated off-station yield trials in Valley County in cooperation with MAES. Cooperator: Kelly Donovan.

Variety	# of Years	1990	1991	1992	1993	1994	Ave	as % of Newana
Dalen	2	--	--	--	61.4	65.0	63.2	102.7
Grandin	4	62.8	64.9	--	61.4	63.8	63.2	102.3
Sonja	2	--	--	--	62.0	63.9	63.0	102.3
Pioneer 2375	3	--	63.5	--	61.7	64.8	63.3	102.2
Pondera	5	61.2	64.0	62.0	60.7	63.2	62.2	101.8
Westbred Rambo	4	61.9	63.5	60.1	--	64.7	62.6	101.7
Bergen	3	--	--	60.5	60.8	63.3	61.5	101.7
Amidon	5	61.7	63.0	61.2	61.0	63.3	62.0	101.5
Lew	3	65.8	62.0	--	--	64.9	63.2	101.1
Hi-Line	5	61.0	61.5	60.8	60.6	64.4	61.7	100.9
ND 677	1	--	--	--	--	64.1	64.1	100.8
McNeal	3	--	--	59.3	60.2	63.2	60.9	100.6
Border	1	--	--	--	--	63.8	63.8	100.3
Kulm	1	--	--	--	--	63.7	63.7	100.2
Newana	5	61.2	62.8	58.5	59.5	63.6	61.1	100.0
Klasic	1	--	--	--	--	63.6	63.6	100.0
Gus	5	60.6	61.5	59.6	60.0	63.2	61.0	99.8
Stoa	3	60.8	62.0	--	--	64.9	62.2	99.5
Probrand 751	2	--	--	56.2	--	62.7	59.4	97.4
Westbred 926	3	59.4	60.0	57.1	--	--	58.8	96.7

Table 26. Relative protein concentrations of spring wheat cultivars grown in irrigated off-station yield trials in Valley County in cooperation with MAES. Cooperator: Kelly Donovan.

Variety	# of Years	1990	1991	1992	1993	1994	Ave	as % of Newana
Kulm	1	--	--	--	--	17.7	17.7	124.6
ND 677	1	--	--	--	--	17.2	17.2	121.1
Gus	5	16.9	15.7	14.6	16.2	16.0	15.9	115.4
Stoa	3	16.8	14.9	--	--	15.9	15.9	111.5
Dalen	2	--	--	--	14.8	15.6	15.2	110.9
Grandin	4	16.9	14.6	--	14.6	15.1	15.3	109.5
Border	1	--	--	--	--	15.4	15.4	108.5
Pioneer 2375	3	--	14.3	--	13.6	15.3	14.4	106.4
Sonja	2	--	--	--	13.8	15.3	14.6	106.2
McNeal	3	--	--	12.8	14.4	15.2	14.1	105.2
Hi-Line	5	15.3	14.4	13.0	14.8	14.7	14.4	104.9
Klasic	1	--	--	--	--	14.9	14.9	104.9
Pondera	5	16.4	13.5	12.8	14.5	14.9	14.4	104.8
Lew	3	15.4	14.4	--	--	14.5	14.8	103.7
Westbred 926	3	15.8	14.2	12.9	--	--	14.3	103.6
Amidon	5	15.1	13.9	12.9	13.9	15.3	14.2	103.3
Bergen	3	--	--	12.2	14.2	14.8	13.7	102.2
Newana	5	15.3	13.2	12.9	13.2	14.2	13.8	100.0
Probrand 751	2	--	--	13.0	--	13.6	13.3	98.2
Westbred Rambo	4	15.0	12.9	12.2	--	14.1	13.6	97.5

Table 27/. Agronomic data collected from an off-station dryland durum yield trial grown in Roosevelt County in cooperation with the MSU Extension Service.
Cooperator: Mark Swank. Planted: 19 April 1994 Harvested: 9 August 1994

Cultivar	protein content	test weight lb/bu	yield bu/acre
Plenty	11.6	61.2	54.2
Renville	11.4	61.5	53.8
Ward	11.9	62.2	53.3
Kyle	11.6	61.6	52.8
Medora	11.9	61.9	49.4
Monroe	12.2	61.7	48.2
Vic	12.2	61.9	47.9
Westbred Laker	12.1	59.4	41.4xx
mean	11.8	61.4	50.1
F-ratio	1.20	13.40**	2.71*
CV (S/mean)	4.13	0.68	9.12
CV (SE/mean)	2.39	0.39	5.27
LSD 0.05	NS	0.73	8.01
LSD 0.01		1.02	11.1

* indicates significant difference among cultivars at probability < 0.05

**indicates significant difference among cultivars at probability < 0.01

xx indicates significantly lower yield than check cultivar, Ward, at $p < 0.01$

NS indicates no significant difference among cultivars

Table 28. Relative yields of durum cultivars grown in dryland off-station nurseries in Roosevelt County in cooperation with MAES. Cooperator: Mark Swank.

Cultivar	# of Years	1989	1990	1992	1993	1994	Ave	as % of Ward
Renville	5	22.4	20.4	48.0	53.5	53.8	39.6	109.4
Plenty	1	--	--	--	--	54.2	54.2	101.7
Ward	5	21.3	20.6	44.6	41.3	53.3	36.2	100.0
Kyle	1	--	--	--	--	52.8	52.8	99.1
Medora	5	22.0	19.3	43.2	45.2	49.4	35.8	98.9
Monroe	5	26.1	16.8	36.3	43.7	48.2	34.2	94.5
Westbred Laker	3	23.6	22.3	--	--	41.4	29.1	91.7
Vic	3	21.7	17.1	--	--	47.9	28.9	91.1

Table 29. Relative test weights of durum cultivars grown in dryland off-station nurseries in Roosevelt County in cooperation with MAES. Cooperator: Mark Swank.

Cultivar	# of Years	1989	1990	1992	1993	1994	Ave	as % of Ward
Vic	3	63.5	63.3	--	--	61.9	62.9	100.8
Medora	5	63.2	63.1	63.6	62.0	61.9	62.8	100.7
Ward	5	63.1	61.9	63.2	61.3	62.2	62.3	100.0
Renville	5	62.4	62.6	63.2	61.8	61.5	62.3	99.9
Westbred Laker	3	63.1	64.0	--	--	59.4	62.2	99.6
Kyle	1	--	--	--	--	61.6	61.6	99.0
Monroe	5	62.4	59.4	63.1	60.2	61.7	61.4	98.4
Plenty	1	--	--	--	--	61.2	61.2	98.4

Table 30. Relative protein contents of durum cultivars grown in dryland off-station nurseries in Roosevelt County in cooperation with MAES. Cooperator: Mark Swank.

Cultivar	# of Years	1989	1990	1992	1993	1994	Ave	as % of Ward
Medora	5	17.2	20.3	15.0	12.3	11.9	15.3	102.5
Ward	5	17.3	18.8	14.8	12.0	11.9	15.0	100.0
Monroe	5	16.2	18.8	14.4	12.2	12.2	14.8	98.7
Renville	5	17.0	19.0	14.6	11.2	11.4	14.6	97.9
Vic	3	16.1	18.7	--	--	12.2	15.7	97.9
Plenty	1	--	--	--	--	11.6	11.6	97.5
Kyle	1	--	--	--	--	11.6	11.6	97.5
Westbred Laker	3	14.7	16.5	--	--	12.1	14.4	90.2

Table 31. Agronomic data collected from an off-station dryland durum yield trial grown in Sheridan County in cooperation with MSU Extension Service.

Cooperator: Max Aasheim Planted: 22 April 1994 Harvested: 10 August 1994

Cultivar	protein content	test weight lb/bu	yield bu/acre
Plenty	14.8	59.5	65.3
Kyle	14.1	58.8	63.1
Renville	15.2	58.9	62.8
Vic	15.1	61.0	61.8
Ward	15.5	60.2	60.5
Medora	15.6	60.1	57.9
Monroe	14.8	60.4	57.4
Westbred Laker	13.7	56.5	36.5xx
mean	14.8	59.4	58.2
F-ratio	4.99**	4.93**	5.75**
CV (S/mean)	3.46	1.83	11.3
CV (SE/mean)	2.00	1.05	6.55
LSD 0.05	0.90	1.90	11.5
LSD 0.01	1.25	2.64	16.0

** indicates significant differences among cultivars at $p < 0.01$

xx indicates significantly lower yield than check cultivar, Ward, at $p = 0.01$

Table 32. Relative yields of durum cultivars grown in dryland off-station yield trials in Sheridan County in cooperation with MAES.
Cooperator: Max Aasheim.

Cultivar	# of Years	1989	1991	1992	1993	1994	Ave	as % of Ward
Plenty	2	--	--	48.0	--	65.3	56.6	112.8
Kyle	1	--	--	--	--	63.1	63.1	104.3
Renville	5	21.2	34.9	43.5	21.7	62.8	36.8	103.8
Ward	5	19.8	35.9	39.9	21.2	60.5	35.5	100.0
Medora	5	20.7	37.1	40.2	19.7	57.9	35.1	99.0
Monroe	5	20.7	32.8	43.8	17.9	57.4	34.5	97.3
Vic	3	18.1	29.8	--	--	61.8	36.6	94.4
Westbred Laker	3	21.2	33.9	--	--	36.5	30.5	78.8

Table 33. Relative test weights of durum cultivars grown in dryland off-station yield trials in Sheridan County in cooperation with MAES.
Cooperator: Max Aasheim.

Cultivar	# of Years	1989	1991	1992	1993	1994	Ave	as % of Ward
Vic	3	62.1	63.5	--	--	61.0	62.2	101.5
Medora	5	60.9	63.5	61.2	62.3	60.1	61.6	100.5
Renville	5	61.2	63.8	61.5	61.8	58.9	61.4	100.3
Ward	5	60.6	63.1	60.9	61.6	60.2	61.3	100.0
Westbred Laker	3	63.5	63.8	--	--	56.5	61.3	99.9
Plenty	2	--	--	60.9	--	59.5	60.2	99.4
Monroe	5	60.9	62.6	60.1	60.3	60.4	60.9	99.3
Kyle	1	--	--	--	--	58.8	58.8	97.7

Table 34. Relative protein concentrations of durum cultivars grown in dryland off-station yield trials in Sheridan County in cooperation with MAES.
Cooperator: Max Aasheim.

Cultivar	# of Years	1989	1991	1992	1993	1994	Ave	as % of Ward
Plenty	1	--	--	13.6	--	14.8	14.2	101.8
Vic	3	16.0	14.6	--	--	15.1	15.2	101.3
Medora	5	15.5	14.3	13.4	14.2	15.6	14.6	101.2
Ward	5	16.3	13.3	12.4	14.6	15.5	14.4	100.0
Monroe	5	14.4	14.4	12.9	15.0	14.8	14.3	99.2
Renville	5	15.0	13.9	12.5	13.9	15.2	14.1	97.8
Westbred Laker	3	14.7	13.1	--	--	13.7	13.8	92.0
Kyle	1	--	--	--	--	14.1	14.1	91.0

Table 35. Relative yields of durum cultivars grown in irrigated off-station yield trials in Sheridan County in cooperation with MAES. Cooperator: Steve Brekke.

Cultivar	# of Years	1989	1990	1991	1992	1993	Ave	as % of Ward
Cando	3	74.7	63.3	38.9	--	--	59.0	111.7
Lloyd	3	81.8	52.3	35.7	--	--	56.6	107.3
Medora	5	66.1	55.01	41.3	72.3	73.2	61.6	106.1
Sceptre	4	70.1	57.2	33.7	--	73.4	58.6	105.3
Ward	5	67.6	57.7	33.0	67.5	64.3	58.0	100.0
Renville	4	53.5	60.2	33.6	--	67.1	53.6	96.3
Stockholm	4	75.2	58.0	--	71.3	41.3	61.4	95.6
Monroe	4	42.4	41.2	35.1	--	86.3	51.2	92.1

Table 36. Relative test weights of durum cultivars grown in irrigated off-station yield trials in Sheridan County in cooperation with MAES. Cooperator: Steve Brekke.

Cultivar	# of Years	1989	1990	1991	1992	1993	Ave	as % of Ward
Ward	5	61.5	57.5	59.2	59.6	61.3	59.8	100.0
Medora	5	62.1	57.5	58.0	60.4	59.6	59.5	99.5
Renville	4	62.0	58.0	58.0	--	59.7	59.4	99.2
Cando	3	61.6	57.5	56.4	--	--	58.5	98.5
Monroe	4	61.0	57.0	57.8	--	59.7	58.9	98.3
Sceptre	4	61.1	57.0	57.8	--	58.0	58.5	97.7
Lloyd	3	61.8	56.0	56.0	--	--	57.9	97.5
Stockholm	4	62.3	57.5	--	57.8	54.6	58.0	96.8

Table 37. Relative protein concentrations of durum cultivars grown in irrigated off-station yield trials in Sheridan County in cooperation with MAES. Cooperator: Steve Brekke.

Cultivar	# of Years	1989	1990	1991	1992	1993	Ave	as % of Ward
Monroe	4	12.7	15.5	13.0	--	14.0	13.8	103.6
Medora	5	11.4	16.5	15.0	13.8	14.4	14.2	104.7
Renville	4	11.5	15.0	13.6	--	14.2	13.6	101.9
Ward	5	11.5	15.3	11.9	14.6	14.6	13.6	100.0
Sceptre	4	10.4	15.8	12.4	--	14.2	13.2	99.1
Cando	3	9.8	13.5	14.1	--	--	12.5	96.6
Lloyd	3	10.1	13.6	13.4	--	--	12.4	95.9
Stockholm	4	10.1	13.6	--	13.0	15.3	13.0	92.9