

PROJECT TITLE: Off-station durum yield trials - 1998

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

PROJECT LEADER:

Joyce Eckhoff, MSU Eastern Agricultural Research Center, Sidney, MT

MATERIALS AND METHODS:

Fourteen durum varieties were planted at three dryland and two irrigated sites. Plots were 20 feet long and three feet wide, with one foot between rows. Entire plots were harvested using a plot combine. Planting and harvest dates were

Location	Planted	Harvested
Poplar, Roosevelt County – dryland	1 May	13 Aug
Circle, McCone County – dryland	23 Apr	6 Aug
Reserve, Sheridan County – dryland	1 May	18 Aug
Scobey, Daniels County – irrigated	4 May	26 Aug
Dagmar, Sheridan County – irrigated	1 May	18 Aug

RESULTS:

Summaries of yields, test weights, heights and protein contents across off-station trials are shown in Tables 1-4. Montrail was the highest yielding variety across all dryland sites, and Plenty was highest yielding across irrigated sites. Performance and relative values of durum varieties for **Reserve** are shown in Tables 5-8, for **Circle** in Tables 9-12, for **Poplar** in Tables 13-16, for **Scobey** in Tables 17-20, and for **Dagmar** in Tables 21-24.

FUTURE PLANS:

Off-station durum yield trials will continue indefinitely. Expansion to other locations in future years is possible.

Table 1. Summary of durum yields in bu/acre at three dryland and two irrigated off-station sites in eastern Montana.

Variety	dryland				irrigated		
	Reserve	Circle	Poplar	average	Scobey	Dagmar	average
Montrail	52.6	33.9	38.4	41.6	40.9	72.3	56.6
Plenty	47.5	32.6	39.9	40.0	48.4	68.8	58.6
Maier	49.4	30.4	40.0	39.9	42.6	68.8	55.7
Ben	48.2	28.9	41.5	39.5	43.6	66.3	55.0
D91080	53.2	28.7	35.9	39.3	49.3	67.3	58.3
Kyle	43.0	35.1	39.0	39.0	51.5	65.1	58.3
Kari	47.8	28.0	38.7	38.2	41.2	72.0	56.6
D901518	47.5	30.9	36.2	38.2	45.6	64.5	55.0
Dressler	45.9	30.3	35.3	37.2	43.1	66.7	54.9
Munich	46.4	30.0	34.3	36.9	42.6	61.4	52.0
D87450	42.6	28.5	39.2	36.8	39.8	52.8	46.3
Renville	45.8	27.5	35.8	36.4	36.8	60.1	48.4
Voss	40.8	27.2	39.8	36.0	32.9	59.5	46.2
AC Melita	44.4	25.3	35.8	35.2	42.3	70.5	56.4
Monroe	39.5	30.6	34.3	34.8	47.8	59.2	53.5
Lloyd	43.9	25.1	33.8	34.3	35.7	54.8	45.2
Vic	43.2	23.3	30.2	32.2	35.3	52.7	44.0
Belzer	45.9	--	40.3	--	45.4	--	--
AC Morse	--	31.2	--	--	--	66.5	--
site average	46.0	29.3	37.1		42.5	63.9	
p value	0.099	0.001	0.000		0.014	0.003	
CV (S/Mean)	10.6	9.7	6.8		13.5	9.7	
CV(SE/Mean)	6.1	5.6	4.0		7.8	5.6	
LSD _{0.05}	NS	4.7	4.2		9.5	10.3	
Planting date	1 May	23 Apr	1 May		4 May	1 May	
Harvest date	18 Aug	6 Aug	13 Aug		26 Aug	18 Aug	

Cooperators:

County
 Sheridan Co, dryland
 McCone Co
 Roosevelt Co
 Daniels Co
 Sheridan Co, irrigated

Producer
 Max Aasheim
 Victor Wagner
 Mark Swank
 Kenny Bensen
 Steve Brekke

CES Agent
 Terry Angvick
 Nels Boe
 Chet Hill
 Bobbie Roos
 Terry Angvick

Table 2. Summary of durum test weights in lb/bu at three dryland and two irrigated off-station sites in eastern Montana.

Variety	dryland				irrigated		
	Reserve	Circle	Poplar	average	Scobey	Dagmar	average
Ben	62.7	61.8	63.3	62.6	61.0	63.0	62.0
Maier	62.2	62.3	62.8	62.4	60.7	62.5	61.6
Renville	62.3	61.5	63.0	62.3	61.3	62.3	61.8
Vic	62.2	61.2	62.8	62.1	62.2	60.7	61.4
Kyle	61.5	62.0	62.5	62.0	61.7	61.8	61.8
Kari	61.3	61.5	62.7	61.8	60.5	61.7	61.1
D91080	62.0	62.0	61.3	61.8	60.0	61.5	60.8
Montrail	61.0	62.0	62.2	61.7	60.2	61.0	60.6
D901518	60.8	61.8	62.2	61.6	59.7	61.0	60.4
Plenty	61.5	61.2	61.8	61.5	61.3	61.3	61.3
Dressler	61.3	61.5	61.8	61.5	59.5	60.7	60.1
Voss	60.3	61.2	62.5	61.3	60.0	60.5	60.2
Monroe	60.8	60.8	62.2	61.3	60.7	60.5	60.6
AC Melita	61.3	60.6	62.0	61.3	60.0	60.5	60.2
Munich	60.8	61.3	61.8	61.3	59.5	60.7	60.1
D87450	59.7	60.1	61.3	60.4	59.0	58.3	58.6
Lloyd	59.3	59.5	60.8	59.9	56.8	59.0	57.9
Belzer	60.8	--	61.7	--	60.8	--	--
AC Morse	--	59.8	--	--	--	60.8	--
site average	61.2	61.2	62.2		60.3	61.0	
p value	0.000	0.000	0.000		0.005	0.000	
CV (S/Mean)	0.7	1.1	0.7		2.1	1.5	
CV(SE/Mean)	0.4	0.7	0.4		1.2	0.9	
LSD _{0.05}	0.7	1.2	0.7		2.1	1.5	
Planting date	1 May	23 Apr	1 May		4 May	1 May	
Harvest date	18 Aug	6 Aug	13 Aug		26 Aug	18 Aug	

Cooperators:

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 Sheridan Co, dryland
 McCone Co
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 Daniels Co
 Sheridan Co, irrigated

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Table 3. Summary of durum heights in inches at three dryland and two irrigated off-station sites in eastern Montana.

Variety	dryland				irrigated		
	Reserve	Circle	Poplar	average	Scobey	Dagmar	average
Kyle	34	31	36	33.7	39	41	40.0
Plenty	33	31	36	33.3	38	40	39.0
Renville	32	30	31	31.0	36	36	36.0
Vic	33	28	32	31.0	36	36	36.0
AC Melita	31	30	31	30.7	36	37	36.5
Dressler	32	29	30	30.3	37	36	36.5
Monroe	31	28	31	30.0	35	35	35.0
Montrail	30	28	29	29.0	32	34	33.0
Maier	30	26	30	28.7	33	34	33.5
Ben	29	25	31	28.3	34	35	34.5
Kari	29	26	30	28.3	32	33	32.5
D901518	29	27	29	28.3	33	33	33.0
D91080	29	26	27	27.3	31	29	30.0
Munich	29	25	28	27.3	31	32	31.5
Lloyd	27	25	25	25.7	28	28	28.0
D87450	26	25	26	25.7	31	27	29.0
Voss	25	25	25	25.0	27	27	27.0
Belzer	31	--	34	--	34	--	--
AC Morse	--	27	--	--	--	34	--
site average	29.9	27.3	30.0		33.5	33.8	
p value	0.000	0.000	0.000		0.000	0.000	
CV (S/Mean)	5.0	5.8	4.3		4.7	4.3	
CV(SE/Mean)	2.9	3.4	2.5		2.7	2.5	
LSD _{0.05}	2.5	2.7	2.1		2.6	2.4	
Planting date	1 May	23 Apr	1 May		4 May	1 May	
Harvest date	18 Aug	6 Aug	13 Aug		26 Aug	18 Aug	

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Table 4. Summary of durum grain protein contents at three dryland and two irrigated off-station sites in eastern Montana.

Variety	dryland				irrigated		
	Reserve	Circle	Poplar	average	Scobey	Dagmar	average
Maier	13.1	15.6	15.8	14.8	13.9	14.4	14.2
Munich	12.9	15.1	15.7	14.6	13.8	13.8	13.8
Ben	12.8	15.1	15.7	14.5	13.0	14.0	13.5
Monroe	12.9	15.2	15.3	14.5	12.8	13.8	13.3
Vic	12.5	15.0	15.6	14.4	13.4	14.6	14.0
Renville	12.4	15.2	15.4	14.3	13.2	14.4	13.8
D91080	12.3	15.2	15.1	14.2	13.3	13.1	13.2
Kari	12.4	14.6	15.6	14.2	13.3	14.3	13.8
Dressler	12.6	14.5	15.5	14.2	14.0	14.2	14.1
AC Melita	12.3	15.2	15.0	14.2	13.4	14.2	13.8
Plenty	12.3	14.8	15.2	14.1	13.6	14.9	14.3
Montrail	12.2	14.4	15.2	13.9	13.4	14.3	13.9
Voss	12.4	14.4	14.8	13.9	12.8	13.7	13.3
Kyle	12.1	14.7	14.6	13.8	13.8	14.6	14.2
D901518	12.3	14.0	14.9	13.7	13.6	13.4	13.5
Lloyd	12.0	14.0	14.8	13.6	13.8	13.2	13.5
D87450	12.1	13.3	13.7	13.0	12.8	12.5	12.7
Belzer	12.1	--	14.8	--	13.3	--	--
AC Morse	--	14.9	--	--	--	14.0	--
site average	12.42	14.73	15.16		13.36	13.96	
p value	0.000	0.000	0.000		0.000	0.000	
CV (S/Mean)	2.3	3.0	2.1		2.2	2.0	
CV(SE/Mean)	1.3	1.7	1.2		1.3	1.2	
LSD _{0.05}	0.5	0.7	0.5		0.5	0.5	
Planting date	1 May	23 Apr	1 May		4 May	1 May	
Harvest date	18 Aug	6 Aug	13 Aug		26 Aug	18 Aug	

Cooperators:

County
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Table 5. Performance of durum grown under dryland conditions at Reserve, MT.
 Planted: 1 May 1998 Harvested: 18 August 1998 Cooperator: Max Aasheim

Variety	Height, inches	Test weight	Grain protein	Yield, bu/acre
D91080	29	62.0	12.3	53.2
Montrail	30	61.0	12.2	52.6
Maier	30	62.2	13.1	49.4
Ben	29	62.7	12.8	48.2
Kari	29	61.3	12.4	47.8
Plenty	33	61.5	12.3	47.5
D901518	29	60.8	12.3	47.5
Munich	29	60.8	12.9	46.4
Belzer	31	60.8	12.1	45.9
Dressler	32	61.3	12.6	45.9
Renville	32	62.3	12.4	45.8
AC Melita	31	61.3	12.3	44.4
Lloyd	27	59.3	12.0	43.9
Vic	33	62.2	12.5	43.2
Kyle	34	61.5	12.1	43.0
D87450	26	59.7	12.1	42.6
Voss	25	60.3	12.4	40.8
Monroe	31	60.8	12.9	39.5
average	29.9	61.2	12.42	46.0
p value	0.000	0.000	0.000	0.099
CV (S/Mean)	5.0	0.7	2.3	10.6
CV(SE/Mean)	2.9	0.4	1.3	6.1
LSD _{0.05}	2.5	0.7	0.5	NS

Table 6. Relative yields of durum varieties as compared to Renville when grown under dryland conditions in Sheridan County in cooperation with CES. Cooperator: Max Aasheim

Cultivar	1994	1995	1996	1997	1998	Ave	as % of. Renville
D91080	--	--	--	--	53.2	53.2	116.2
Montrail	--	--	--	--	52.6	52.6	114.8
Maier	--	--	--	--	49.4	49.4	107.9
Kari	--	--	--	--	47.8	47.8	104.4
D901518	--	--	--	--	47.5	47.5	103.7
Kyle	63.1	33.2	32.8	36.1	43.0	41.6	101.8
Renville	62.8	29.5	35.5	31.0	45.8	40.9	100.0
Plenty	65.3	26.9	32.8	30.0	47.5	40.5	99.0
Vic	61.8	31.2	34.4	29.8	43.2	40.1	98.4
Munich	--	27.5	34.0	30.8	46.4	34.7	97.8
Ben	--	--	32.7	28.4	48.2	36.4	97.3
Lloyd	--	--	--	--	43.9	43.9	95.9
AC Melita	--	--	--	28.8	44.4	36.6	95.3
Dressler	--	--	33.4	27.2	45.9	35.5	94.8
Voss	--	28.7	32.5	28.1	40.8	32.5	91.7
Belzer	--	--	--	23.8	45.9	34.8	90.8
Monroe	57.4	28.9	27.5	24.0	39.5	35.5	86.7
D87450	--	--	--	22.8	42.6	32.7	85.2

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

Table 7. Relative test weights of durum varieties as compared to Renville when grown under dryland conditions in Sheridan County in cooperation with CES. Cooperator: Max Aasheim

Cultivar	1994	1995	1996	1997	1998	Ave	as % of Renville
Ben	--	--	64.5	60.7	62.7	62.6	100.5
Kyle	58.8	63.3	63.5	61.2	61.5	61.7	100.4
Vic	61.0	61.0	63.5	60.5	62.2	61.6	100.4
Renville	58.9	61.2	63.8	60.8	62.3	61.4	100.0
Plenty	59.5	62.1	64.0	59.2	61.5	61.3	99.8
Maier	--	--	--	--	62.2	62.2	99.8
Voss	--	62.5	64.3	60.3	60.3	61.8	99.7
Dressler	--	--	64.5	60.5	61.3	62.1	99.7
D91080	--	--	--	--	62.0	62.0	99.5
Monroe	60.4	59.8	63.7	60.2	60.8	61.0	99.3
Munich	--	62.0	64.0	59.2	60.8	61.5	99.2
AC Melita	--	--	--	60.3	61.3	60.8	98.8
Kari	--	--	--	--	61.3	61.3	98.4
Belzer	--	--	--	59.7	60.8	60.2	97.9
Montrail	--	--	--	--	61.0	61.0	97.9
D901518	--	--	--	--	60.8	60.8	97.6
D87450	--	--	--	59.2	59.7	59.4	96.6
Lloyd	--	--	--	--	59.3	59.3	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.

Table 8. Relative proteins of durum varieties as compared to Renville when grown under dryland conditions in Sheridan County in cooperation with CES. Cooperator: Max Aasheim

Cultivar	1994	1995	1996	1997	1998	Ave	as % of Renville
Maier	--	--	--	--	13.1	13.10	105.6
Dressler	--	--	13.4	13.4	12.6	13.13	104.5
Munich	--	9.4	13.3	12.8	12.9	12.10	104.1
Ben	--	--	13.4	13.0	12.8	13.07	104.0
Plenty	14.8	9.3	14.4	13.3	12.3	12.82	103.9
Monroe	14.8	9.2	13.0	13.3	12.9	12.64	102.4
Voss	--	10.0	12.9	12.2	12.4	11.88	102.2
Vic	15.1	9.2	13.5	12.4	12.5	12.54	101.6
Kyle	14.1	9.2	13.5	13.5	12.1	12.48	101.1
Renville	15.2	8.8	12.6	12.7	12.4	12.34	100.0
AC Melita	--	--	--	12.8	12.3	12.55	100.0
Kari	--	--	--	--	12.4	12.40	100.0
D91080	--	--	--	--	12.3	12.30	99.2
D901518	--	--	--	--	12.3	12.30	99.2
Montrail	--	--	--	--	12.2	12.20	98.4
Belzer	--	--	--	12.5	12.1	12.30	98.0
Lloyd	--	--	--	--	12.0	12.00	96.8
D87450	--	--	--	11.9	12.1	12.00	95.6

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

Table 9. Performance of durum grown under dryland conditions at Circle, MT.

Planted: 23 April 1998 Harvested: 6 August 1998

Cooperator: Victor Wagner

Variety	height, inches	grain protein	test weight	yield, bu/acre
Kyle	31	14.7	62.0	35.1
Montrail	28	14.4	62.0	33.9
Plenty	31	14.8	61.2	32.6
AC Morse	27	14.9	59.8	31.2
D901518	27	14.0	61.8	30.9
Monroe	28	15.2	60.8	30.6
Maier	26	15.6	62.3	30.4
Dressler	29	14.5	61.5	30.3
Munich	25	15.1	61.3	30.0
Ben	25	15.1	61.8	28.9
D91080	26	15.2	62.0	28.7
D87450	25	13.3	60.1	28.5
Kari	26	14.6	61.6	28.0
Renville	30	15.2	61.5	27.5
Voss	25	14.4	61.2	27.2
AC Melita	30	15.2	60.6	25.3
Lloyd	25	14.0	59.5	25.1
Vic	28	15.0	61.2	23.3
average	27.3	14.73	61.2	29.3
p value	0.000	0.000	0.000	0.001
CV (S/Mean)	5.8	3.0	1.1	9.7
CV(SE/Mean)	3.4	1.7	0.7	5.6
LSD 0.05	2.7	0.7	1.2	4.7

Table 10. Relative yielding abilities of durum varieties as compared to Renville when grown under dryland conditions in McCone County in cooperation with CES.

Cooperator: Victor Wagner

Variety	1996	1998	average	As % of Renville
Montrail	--	33.9	33.9	123.3
AC Morse	--	31.2	31.2	113.5
Kyle	12.4	35.1	23.8	113.3
D901518	--	30.9	30.9	112.4
Plenty	14.0	32.6	23.3	111.0
Maier	--	30.4	30.4	110.5
Dressler	15.1	30.3	22.7	108.1
D91080	--	28.7	28.7	104.4
D87450	--	28.5	28.5	103.6
Munich	13.1	30.0	21.6	102.6
Kari	--	28.0	28.0	101.8
Renville	14.5	27.5	21.0	100.0
Monroe	11.0	30.6	20.8	99.0
Voss	14.0	27.2	20.6	98.1
Ben	11.6	28.9	20.2	96.2
AC Melita	--	25.3	25.3	92.0
Lloyd	--	25.1	25.1	91.3
Vic	12.0	23.3	17.6	83.8

Table 11. Relative test weights of durum varieties as compared to Renville when grown under dryland conditions in McCone County in cooperation with CES.

Cooperator: Victor Wagner

Variety	1996	1998	average	As % of Renville
Kyle	63.4	62.0	62.7	101.5
Maier	--	62.3	62.3	101.3
Voss	63.8	61.2	62.5	101.1
Ben	63.2	61.8	62.5	101.1
Montrail	--	62.0	62.0	100.8
D91080	--	62.0	62.0	100.8
Dressler	62.7	61.5	62.1	100.5
D901518	--	61.8	61.8	100.5
Kari	--	61.6	61.6	100.2
Renville	62.2	61.5	61.8	100.0
Monroe	62.8	60.8	61.8	100.0
Vic	62.5	61.2	61.8	100.0
Plenty	62.1	61.2	61.6	99.7
Munich	61.6	61.3	61.4	99.4
AC Melita	--	60.6	60.6	98.5
D87450	--	60.1	60.1	97.7
AC Morse	--	59.8	59.8	97.2
Lloyd	--	59.5	59.5	96.7

Table 12. Relative protein contents of durum varieties as compared to Renville when grown under dryland conditions in McCone County in cooperation with CES.

Cooperator: Victor Wagner

Variety	1996	1998	average	As % of Renville
Maier	--	15.6	15.60	102.6
Monroe	13.1	15.2	14.15	101.4
Munich	13.0	15.1	14.05	100.7
Ben	13.0	15.1	14.05	100.7
Renville	12.7	15.2	13.95	100.0
D91080	--	15.2	15.20	100.0
AC Melita	--	15.2	15.20	100.0
Plenty	12.9	14.8	13.85	99.3
Vic	12.7	15.0	13.85	99.3
Kyle	12.9	14.7	13.80	98.9
AC Morse	--	14.9	14.90	98.0
Kari	--	14.6	14.60	96.1
Voss	12.3	14.4	13.35	95.7
Montrail	--	14.4	14.40	94.7
Dressler	11.5	14.5	13.00	93.2
D901518	--	14.0	14.00	92.1
Lloyd	--	14.0	14.00	92.1
D87450	--	13.3	13.30	87.5

Table 13. Performance of durum grown under dryland conditions at Poplar, MT.
 Planted: 1 May 1998 Harvested: 13 August 1998 Cooperator: Mark Swank

Variety	height, inches	grain protein	test weight	yield, bu/acre
Ben	31	15.7	63.3	41.5
Belzer	34	14.8	61.7	40.3
Maier	30	15.8	62.8	40.0
Plenty	36	15.2	61.8	39.9
Voss	25	14.8	62.5	39.8
D87450	26	13.7	61.3	39.2
Kyle	36	14.6	62.5	39.0
Kari	30	15.6	62.7	38.7
Montrail	29	15.2	62.2	38.4
D901518	29	14.9	62.2	36.2
D91080	27	15.1	61.3	35.9
Renville	31	15.4	63.0	35.8
AC Melita	31	15.0	62.0	35.8
Dressler	30	15.5	61.8	35.3
Munich	28	15.7	61.8	34.3
Monroe	31	15.3	62.2	34.3
Lloyd	25	14.8	60.8	33.8
Vic	32	15.6	62.8	30.2
Average	30.0	15.16	62.2	37.1
p value	0.000	0.000	0.000	0.000
CV (S/Mean)	4.3	2.1	0.7	6.8
CV(SE/Mean)	2.5	1.2	0.4	4.0
LSD 0.05	2.1	0.5	0.7	4.2

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

Cultivar	1994	1995	1996	1997	1998	Ave	as % of Renville
Belzer	--	--	--	23.3	40.3	31.8	112.0
Maier	--	--	--	--	40.0	40.0	111.7
Kari	--	--	--	--	38.7	38.7	108.1
Montrail	--	--	--	--	38.4	38.4	107.3
Kyle	52.8	45.3	23.7	26.0	39.0	37.4	106.9
Plenty	54.2	40.6	24.4	27.1	39.9	37.2	106.3
Voss	--	38.7	23.0	24.7	39.8	31.6	104.0
AC Melita	--	--	--	21.9	35.8	28.8	101.6
Dressler	--	--	20.5	26.2	35.3	27.3	101.1
D901518	--	--	--	--	36.2	36.2	101.1
Ben	--	--	21.4	18.8	41.5	27.2	100.7
D87450	--	--	--	17.8	39.2	28.5	100.4
D91080	--	--	--	--	35.9	35.9	100.3
Renville	53.8	40.2	24.3	21.0	35.8	35.0	100.0
Munich	--	43.2	22.8	20.9	34.3	30.3	99.9
Lloyd	--	--	--	--	33.8	33.8	94.4
Vic	47.9	39.4	21.2	21.7	30.2	32.1	91.7
Monroe	48.2	37.3	21.0	18.4	34.3	31.8	90.9

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

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

Cultivar	1994	1995	1996	1997	1998	Ave	as % of Renville
Ben	--	--	61.7	65.0	63.3	63.3	100.4
Renville	61.5	60.8	61.7	64.5	63.0	62.3	100.0
Voss	--	61.1	62.3	63.3	62.5	62.3	99.7
Maier	--	--	--	--	62.8	62.8	99.7
Monroe	61.7	60.2	61.5	64.2	62.2	62.0	99.5
Kari	--	--	--	--	62.7	62.7	99.5
Munich	--	61.9	60.7	64.1	61.8	62.1	99.4
AC Melita	--	--	--	64.8	62.0	63.4	99.4
Vic	61.9	59.2	60.5	64.7	62.8	61.8	99.2
Kyle	61.6	61.0	61.0	62.6	62.5	61.7	99.1
Montrail	--	--	--	--	62.2	62.2	98.7
D901518	--	--	--	--	62.2	62.2	98.7
Plenty	61.2	60.8	61.0	62.4	61.8	61.4	98.6
D87450	--	--	--	63.6	61.3	62.4	98.0
Dressler	--	--	60.4	63.1	61.8	61.8	97.9
Belzer	--	--	--	63.1	61.7	62.4	97.9
D91080	--	--	--	--	61.3	61.3	97.3
Lloyd	--	--	--	--	60.8	60.8	96.5

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 proteins of durum varieties as compared to Renville when grown under dryland conditions in Roosevelt County in cooperation with CES. Cooperator: Mark Swank

Cultivar	1994	1995	1996	1997	1998	Ave	as % of Renville
Dressler	--	--	16.6	15.8	15.5	15.97	105.5
Vic	12.2	16.7	16.1	15.3	15.6	15.18	104.8
Ben	--	--	14.8	16.3	15.7	15.60	103.1
Maier	--	--	--	--	15.8	15.80	102.6
Kari	--	--	--	--	15.6	15.60	101.3
Monroe	12.2	15.3	14.7	15.6	15.3	14.62	101.0
Plenty	11.6	15.7	15.0	15.6	15.2	14.62	101.0
Renville	11.4	15.6	14.2	15.8	15.4	14.48	100.0
Munich	--	14.9	15.0	15.2	15.7	15.20	99.7
Kyle	11.6	16.0	14.0	15.8	14.6	14.40	99.4
AC Melita	--	--	--	15.8	15.0	15.40	98.7
Montrail	--	--	--	--	15.2	15.20	98.7
D91080	--	--	--	--	15.1	15.10	98.1
D901518	--	--	--	--	14.9	14.90	96.8
Lloyd	--	--	--	--	14.8	14.80	96.1
Voss	--	14.9	13.0	14.5	14.8	14.30	93.8
Belzer	--	--	--	14.3	14.8	14.55	93.3
D87450	--	--	--	13.6	13.7	13.65	87.5

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 17. Performance of durum 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
Kyle	39	61.7	13.8	51.5
D91080	31	60.0	13.3	49.3
Plenty	38	61.3	13.6	48.4
Monroe	35	60.7	12.8	47.8
D901518	33	59.7	13.6	45.6
Belzer	34	60.8	13.3	45.4
Ben	34	61.0	13.0	43.6
Dressler	37	59.5	14.0	43.1
Maier	33	60.7	13.9	42.6
Munich	31	59.5	13.8	42.6
AC Melita	36	60.0	13.4	42.3
Kari	32	60.5	13.3	41.2
Montrail	32	60.2	13.4	40.9
D87450	31	59.0	12.8	39.8
Renville	36	61.3	13.2	36.8
Lloyd	28	56.8	13.3	35.7
Vic	36	62.2	13.4	35.3
Voss	27	60.0	12.8	32.9
average	33.5	60.3	13.36	42.5
p value	0.000	0.005	0.000	0.014
CV (S/Mean)	4.7	2.1	2.2	13.5
CV(SE/Mean)	2.7	1.2	1.3	7.8
LSD 0.05	2.6	2.1	0.5	9.5

Table 18. Relative yields of durum varieties as compared to Renville when grown under irrigated conditions in Daniels County in cooperation with CES. Cooperator: Kenny Benson

Variety	1996	1997	1998	average	As % of Renville
D91080	--	--	49.3	49.3	134.0
D901518	--	--	45.6	45.6	123.9
Kyle	64.0	50.7	51.5	55.4	119.2
Maier	--	--	42.6	42.6	115.8
AC Melita	--	46.2	42.3	44.2	114.7
Belzer	--	42.4	45.4	43.9	113.4
Kari	--	--	41.2	41.2	112.0
Montrail	--	--	40.9	40.9	111.1
Dressler	63.8	47.5	43.1	51.5	110.8
Plenty	63.0	37.5	48.4	49.6	106.8
Ben	58.4	41.3	43.6	47.8	102.8
Munich	57.6	42.0	42.6	47.4	102.0
Renville	62.0	40.6	36.8	46.5	100.0
Lloyd	--	--	35.7	35.7	97.0
D87450	--	34.9	39.8	37.4	96.5
Vic	60.7	36.6	35.3	44.2	95.1
Voss	63.7	33.6	32.9	43.4	93.4
Monroe	46.2	36.1	47.8	43.4	93.3

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 19. Relative test weights of durum varieties as compared to Renville when grown under irrigated conditions in Daniels County in cooperation with CES. Cooperator: Kenny Benson

Variety	1996	1997	1998	average	As % of Renville
Ben	63.3	61.0	61.0	61.8	101.0
Vic	61.7	60.7	62.2	61.5	100.7
Kyle	61.8	60.2	61.7	61.2	100.2
Renville	62.3	59.8	61.3	61.1	100.0
Monroe	61.7	59.7	60.7	60.7	99.3
AC Melita	--	60.0	60.0	60.0	99.1
Maier	--	--	60.7	60.7	99.0
Plenty	61.5	58.2	61.3	60.3	98.7
Kari	--	--	60.5	60.5	98.7
Voss	62.2	58.7	60.0	60.3	98.6
Montrail	--	--	60.2	60.2	98.2
Dressler	61.5	58.8	59.5	59.9	98.0
D91080	--	--	60.0	60.0	97.9
Munich	61.3	58.5	59.5	59.8	97.8
Belzer	--	57.7	60.8	59.2	97.6
D901518	--	--	59.7	59.7	97.4
D87450	--	56.5	59.0	57.8	95.4
Lloyd	--	--	56.8	56.8	92.7

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 20. Relative proteins of durum varieties as compared to Renville when grown under irrigated conditions in Daniels County in cooperation with CES. Cooperator: Kenny Benson

Variety	1996	1997	1998	average	As % of Renville
Kyle	14.5	12.4	13.8	13.57	106.3
Maier	--	--	13.9	13.90	105.3
Dressler	13.7	12.6	14.0	13.43	105.2
Plenty	13.9	12.6	13.6	13.37	104.7
AC Melita	--	12.7	13.4	13.05	103.2
Munich	13.2	12.5	13.8	13.17	103.1
D901518	--	--	13.6	13.60	103.0
Vic	13.8	12.0	13.4	13.07	102.3
Montrail	--	--	13.4	13.40	101.5
D91080	--	--	13.3	13.30	100.8
Kari	--	--	13.3	13.30	100.8
Lloyd	--	--	13.3	13.30	100.8
Ben	13.3	12.2	13.0	12.83	100.5
Belzer	--	12.1	13.3	12.70	100.4
Renville	13.0	12.1	13.2	12.77	100.0
Monroe	13.0	12.3	12.8	12.70	99.5
Voss	13.0	12.3	12.8	12.70	99.5
D87450	--	11.8	12.8	12.30	97.2

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 21. Performance of durum grown under irrigated conditions at Dagmar, MT.
 Planted: 1 May 1998 Harvested: 18 August 1998 Cooperator: Steve Brekke

Variety	height, inches	grain protein	test weight	yield, bu/acre
Montrail	34	14.3	61.0	72.3
Kari	33	14.3	61.7	72.0
AC Melita	37	14.2	60.5	70.5
Plenty	40	14.9	61.3	68.8
Maier	34	14.4	62.5	68.8
D91080	29	13.1	61.5	67.3
Dressler	36	14.2	60.7	66.7
AC Morse	34	14.0	60.8	66.5
Ben	35	14.0	63.0	66.3
Kyle	41	14.6	61.8	65.1
D901518	33	13.4	61.0	64.5
Munich	32	13.8	60.7	61.4
Renville	36	14.4	62.3	60.1
Voss	27	13.7	60.5	59.5
Monroe	35	13.8	60.5	59.2
Lloyd	28	13.2	59.0	54.8
D87450	27	12.5	58.3	52.8
Vic	36	14.6	60.7	52.7
average	33.8	13.96	61.0	63.9
p value	0.000	0.000	0.000	0.003
CV (S/Mean)	4.3	2.0	1.5	9.7
CV(SE/Mean)	2.5	1.2	0.9	5.6
LSD 0.05	2.4	0.5	1.5	10.3

Table 22. Relative yields of durum varieties as compared to Renville when grown under irrigated conditions in Sheridan County in cooperation with CES. Cooperator: Steve Brekke

Cultivar	1990	1991	1993	1996	1998	Ave	as % of Renville
Plenty	--	--	--	47.8	68.8	58.3	121.6
Montrail	--	--	--	--	72.3	72.3	120.3
Kari	--	--	--	--	72.0	72.0	119.8
Kyle	--	--	--	48.9	65.1	57.0	118.9
AC Melita	--	--	--	--	70.5	70.5	117.3
Dressler	-	--	--	45.7	66.7	56.2	117.2
Maier	--	--	--	--	68.8	68.8	114.5
D91080	--	--	--	--	67.3	67.3	112.0
AC Morse	--	--	--	--	66.5	66.5	110.6
Ben	--	--	--	38.3	66.3	52.3	109.1
D901518	--	--	--	--	64.5	64.5	107.3
Munich	--	--	--	39.9	61.4	50.6	105.6
Renville	60.2	33.6	67.1	35.8	60.1	51.4	100.0
Vic	58.2	26.8	--	50.1	52.7	47.0	99.0
Monroe	41.2	35.1	86.3	29.2	59.2	50.2	97.7
Voss	--	--	--	33.2	59.5	46.4	96.7
Lloyd	52.3	35.7	--	--	54.8	47.6	92.8
D87450	--	--	--	--	52.8	52.8	87.9

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

Table 23. Relative test weights of durum varieties as compared to Renville when grown under irrigated conditions in Sheridan County in cooperation with CES. Cooperator: Steve Brekke

Cultivar	1990	1991	1993	1996	1998	Ave	as % of Renville
Ben	--	--	--	61.7	63.0	62.4	102.1
Vic	58.0	58.7	--	64.0	60.7	60.4	101.4
Plenty	--	--	--	62.3	61.3	61.8	101.2
Kyle	--	--	--	61.7	61.8	61.8	101.1
Maier	--	--	--	--	62.5	62.5	100.3
Renville	58.0	58.0	59.7	59.8	62.3	59.6	100.0
Munich	--	--	--	60.3	60.7	60.5	99.1
Kari	--	--	--	--	61.7	61.7	99.0
Voss	--	--	--	60.2	60.5	60.4	98.9
Monroe	57.0	57.8	59.7	58.9	60.5	58.8	98.7
D91080	--	--	--	--	61.5	61.5	98.7
Dressler	--	--	--	59.7	60.7	60.2	98.6
Montrail	--	--	--	--	61.0	61.0	97.9
D901518	--	--	--	--	61.0	61.0	97.9
AC Morse	--	--	--	--	60.8	60.8	97.6
AC Melita	--	--	--	--	60.5	60.5	97.1
Lloyd	56.0	56.0	--	--	59.0	57.0	95.9
D87450	--	--	--	--	58.3	58.3	93.6

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

Table 24. Relative protein contents of durum varieties as compared to Renville when grown under irrigated conditions in Sheridan County in cooperation with CES. Cooperator: Steve Brekke

Cultivar	1990	1991	1993	1996	1998	Ave	as % of Renville
Renville	15.0	13.6	14.2	11.3	14.4	13.70	100.0
Dressler	--	--	--	11.5	14.2	12.85	100.0
Maier	--	--	--	--	14.4	14.40	100.0
Montrail	--	--	--	--	14.3	14.30	99.3
Kari	--	--	--	--	14.3	14.30	99.3
AC Melita	--	--	--	--	14.2	14.20	98.6
Monroe	15.5	13.0	14.0	11.1	13.8	13.48	98.4
Kyle	--	--	--	10.5	14.6	12.55	97.7
Voss	--	--	--	11.3	13.7	12.50	97.3
AC Morse	--	--	--	--	14.0	14.00	97.2
Ben	--	--	--	10.9	14.0	12.45	96.9
Vic	15.7	12.1	--	9.2	14.6	12.90	95.0
Plenty	--	--	--	9.4	14.9	12.15	94.6
Munich	--	--	--	10.5	13.8	12.15	94.4
Lloyd	13.6	13.4	--	--	13.2	13.40	93.5
D901518	--	--	--	--	13.4	13.40	93.1
D91080	--	--	--	--	13.1	13.10	91.0
D87450	--	--	--	--	12.5	12.50	86.8

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