

**PROJECT TITLE:** Off-station durum yield trials - 2002

**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

**PROJECT PERSONNEL:**

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

**RESULTS:** Summaries of yields, test weights, heights and protein contents across **dryland sites** are shown in Tables 1-4, and summaries of yields, test weights, heights and protein contents across **irrigated sites** are shown in Tables 29-32. Avonlea and Mountrail yielded most across dryland sites (Table 1). Plaza and Mountrail yielded most across the irrigated sites (Table 29).

**McCone County:** Performance and relative values of durum varieties at **Circle** are shown in Tables 5-8. AC Avonlea yielded most.

**Wibaux County (dryland):** Performance and relative values of durum varieties at **Wibaux** are shown in Tables 9-12. AC Avonlea and Mountrail yielded significantly more than the check variety, Renville.

**Roosevelt County (dryland):** Performance and relative values of durum varieties at **Poplar** are shown in Tables 13-16. Dilse and Lebsock yielded most.

**Sheridan County (dryland):** Performance and relative values of durum varieties at **Reserve** are shown in Tables 17-20. AC Napoleon and Dilse yielded most.

**Valley County (dryland):** Performances of durum varieties at **Nashua** are shown in Table 21-24. Plaza and AC Avonlea yielded most.

**Daniels County (dryland):** Performance and relative values of durum varieties at **Scobey** are shown in Tables 25-28. Kyle yielded most.

**Sheridan County (irrigated):** Performance and relative values of durum varieties at **Dagmar** are shown in Tables 33-36. Kyle, Mountrail and AC Napoleon yielded most. Four lines and

varieties yielded significantly less than the check variety, Renville, including Munich, AS Pathfinder, AC Navigator, and CAS-10-414.

**Roosevelt County (irrigated):** Performances of durum varieties at **Brockton** are shown in Table 37. Plaza, Renville, and Pierce yielded most. This is the first year for this site so no relative values are available.

**SUMMARY:** The off-station yield trials are conducted at several sites in eastern Montana. These trials provide important information about performance of experimental lines and varieties from Montana, other states, and private companies. Regional durum producers make decisions on varieties to grow based on data from these trials.

**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 six dryland off-station sites in eastern Montana, 2002. All sites except McCone (Circle) are on fallow ground.

Variety	Circle	Wibaux	Poplar	Reserve	Nashua	Scobey	average
AC Avonlea	<b>22.5</b>	<b>37.2</b>	38.4	36.8	48.1	31.1	35.7
Mountrail	21.4	36.4	39.9	36.6	46.0	32.3	35.4
Maier	22.1	30.0	39.5	37.5	47.6	33.0	35.0
AC Pathfinder	22.1	35.3	37.4	36.6	43.7	33.7	34.8
Pierce	20.3	32.8	39.5	34.0	47.2	33.3	34.5
Lebsock	15.7	30.8	43.0	35.8	45.6	35.1	34.3
Dilse	19.4	27.1	<b>43.7</b>	37.9	45.4	30.9	34.1
AC Morse	20.9	28.2	41.2	37.4	47.1	29.2	34.0
AC Napoleon	18.7	25.9	37.3	<b>40.4</b>	46.1	33.4	33.6
Ben	18.3	31.4	39.2	33.4	43.6	35.4	33.6
Renville	18.8	28.9	39.4	34.3	44.8	31.4	32.9
Plaza	21.9	25.8	35.7	35.5	<b>48.7</b>	29.6	32.9
Munich	19.6	30.0	38.2	37.0	42.6	28.0	32.6
Kyle	19.3	26.5	34.2	29.9	46.1	<b>38.2</b>	32.4
Belzer	20.5	27.7	33.1	33.1	45.5	32.9	32.1
AC Navigator	17.3	28.0	34.8	30.9	46.8	30.0	31.3
site average	19.9	30.1	38.4	35.4	45.9	32.3	
p value	0.005	0.018	0.049	0.102	0.708	0.228	
CV (S/Mean)	9.7	13.6	9.4	10.2	7.2	12.0	
CV(SE/Mean)	5.6	7.8	5.5	5.9	4.2	6.9	
LSD 0.05	3.2	6.8	6.0	ns	ns	ns	

Cooperators:

County

Sheridan (Reserve)

Wibaux (Wibaux)

McCone (Circle)

Roosevelt (Poplar)

Valley (Nashua)

Producer

Max Aasheim

David Maus

Victor Wagner

Mark Swank

Bill Lauckner

CES Agent

Terry Angvick

Dave Bertelsen

Ken Nelson

Gina Snyder

Verlin Koenig

Table 2. Summary of durum test weights in lb/bu at six dryland off-station sites in eastern Montana, 2002. All sites except McCone (Circle) are on fallow ground.

Variety	Circle	Wibaux	Poplar	Reserve	Nashua	Scobey	average
Lebsock	62.1	61.2	62.0	61.8	61.5	61.8	61.7
Pierce	60.7	61.4	62.0	61.3	62.0	62.7	61.7
Maier	62.2	61.0	60.8	61.2	61.8	62.7	61.6
AC Navigator	63.4	62.0	59.3	61.0	63.2	60.2	61.5
AC Pathfinder	61.7	61.4	60.5	60.8	62.0	62.0	61.4
Kyle	63.0	61.0	60.0	60.0	61.0	61.3	61.1
Dilse	62.0	60.1	61.0	60.3	62.0	60.8	61.0
Ben	60.4	60.7	61.0	60.8	61.0	61.2	60.9
Renville	60.4	60.2	61.5	60.0	60.3	61.3	60.6
AC Avonlea	60.4	60.1	59.5	60.7	61.8	60.7	60.5
Plaza	61.7	60.9	58.2	59.5	60.2	62.7	60.5
Mountrail	58.6	60.0	60.3	60.7	60.7	61.0	60.2
AC Morse	60.1	58.5	58.7	59.0	60.2	61.0	59.6
AC Napoleon	61.1	58.3	58.8	58.8	58.8	61.2	59.5
Munich	59.4	58.5	59.0	59.0	60.3	60.5	59.5
Belzer	58.8	58.8	58.5	59.2	59.7	60.3	59.2
site average	61.0	60.2	60.1	60.3	61.0	61.3	
p value	<0.001	<0.001	<0.001	<0.001	<0.001	0.019	
CV (S/Mean)	1.7	0.9	1.4	0.7	0.9	1.5	
CV(SE/Mean)	1	0.5	0.8	0.4	0.5	0.9	
LSD 0.05	1.7	0.9	1.4	0.7	0.9	1.5	

Cooperators:

County

Sheridan (Reserve)

Wibaux (Wibaux)

McCone (Circle)

Roosevelt (Poplar)

Valley (Nashua)

Producer

Max Aasheim

David Maus

Victor Wagner

Mark Swank

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Gina Snyder

Verlin Koenig

Table 3. Summary of durum heights in inches at six dryland off-station sites in eastern Montana, 2002. All sites except McCone (Circle) are on fallow ground.

Variety	Circle	Wibaux	Poplar	Reserve	Nashua	Scobey	average
Kyle	23	23	38	31	34	31	30.0
Belzer	23	25	35	31	30	29	28.8
Renville	23	23	36	30	31	29	28.7
Ben	23	24	36	29	31	28	28.5
AC Avonlea	23	23	36	31	30	27	28.3
AC Pathfinder	22	25	37	29	30	27	28.3
AC Napoleon	21	21	36	32	32	26	28.0
Dilse	22	22	37	30	31	26	28.0
Maier	22	23	35	30	30	26	27.7
Lebsock	22	22	34	31	29	26	27.3
Pierce	22	21	34	30	30	27	27.3
Mountrail	20	23	36	27	30	24	26.7
Munich	20	22	33	29	28	25	26.2
AC Morse	20	21	34	28	28	25	26.0
Plaza	22	22	28	29	27	25	25.5
AC Navigator	20	21	32	29	25	25	25.3
site average	21.8	22.6	34.8	29.8	29.6	26.5	
p value	0.004	0.039	<0.001	0.490	<0.001	0.001	
CV (S/Mean)	5.3	6.5	4.4	7.6	4	6.2	
CV(SE/Mean)	3	3.7	2.6	4.4	2.3	3.6	
LSD 0.05	1.9	2.4	2.6	ns	2.0	2.7	

Cooperators:

County

Sheridan (Reserve)

Wibaux (Wibaux)

McCone (Circle)

Roosevelt (Poplar)

Valley (Nashua)

Producer

Max Aasheim

David Maus

Victor Wagner

Mark Swank

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Ken Nelson

Gina Snyder

Verlin Koenig

Table 4. Summary of durum protein contents in percent at six dryland off-station sites in eastern Montana, 2002. All sites except McCone (Circle) are on fallow ground.

Variety	Circle	Wibaux	Poplar	Reserve	Nashua	Scobey	average
Munich	13.3	17.1	15.6	15.4	12.5	14.0	14.7
Dilse	12.4	17.7	15.3	15.6	12.7	14.1	14.6
AC Avonlea	13.3	17.1	15.5	15.3	12.0	13.8	14.5
AC Morse	13.3	16.9	15.4	15.4	12.8	13.2	14.5
Maier	13.1	17.1	15.5	15.3	12.8	13.2	14.5
Belzer	13.7	17.2	15.2	15.0	12.6	13.0	14.5
Ben	13.7	16.6	14.9	15.1	12.5	13.7	14.4
Renville	13.1	17.2	14.9	15.0	13.2	13.0	14.4
Mountrail	13.8	16.3	15.1	14.6	12.5	12.2	14.1
Plaza	12.5	17.0	15.2	14.6	12.6	12.4	14.1
AC Navigator	12.3	16.2	15.0	14.6	12.1	13.5	14.0
AC Napoleon	11.0	17.0	15.0	14.8	13.3	12.5	13.9
Pierce	13.7	16.1	14.1	14.6	12.2	12.7	13.9
Kyle	12.2	16.6	15.1	14.4	12.9	12.0	13.9
Lebsock	12.3	15.8	14.2	14.7	12.6	12.9	13.8
AC Pathfinder	12.4	16.2	14.7	14.6	11.2	13.2	13.7
site average	12.9	16.8	15.0	14.9	12.5	13.1	
p value	0.335	0.064	0.013	<0.001	0.421	0.062	
CV (S/Mean)	9.6	3.8	3.0	1.9	6.8	6.1	
CV(SE/Mean)	5.5	2.2	1.8	1.1	3.9	3.5	
LSD 0.05	ns	1.1	0.8	0.5	ns	1.3	

Cooperators:

County

Sheridan (Reserve)

Wibaux (Wibaux)

McCone (Circle)

Roosevelt (Poplar)

Valley (Nashua)

Producer

Max Aasheim

David Maus

Victor Wagner

Mark Swank

Bill Lauckner

CES Agent

Terry Angvick

Dave Bertelsen

Ken Nelson

Gina Snyder

Verlin Koenig

Table 5. Performance of durum grown under dryland continuous cropping conditions at Circle, MT. Planted: 13 May 2002 Harvested: 20 August 2002 Cooperator: Victor Wagner

Variety	height, inches	grain protein	test weight	yield, bu/acre
AC Avonlea	23	13.3	60.4	<b>22.5</b>
AC Pathfinder	22	12.4	61.7	22.1
Maier	22	13.1	62.2	22.1
Plaza	22	12.5	61.7	21.9
Mountrail	20	13.8	58.6	21.4
AC Morse	20	13.3	60.1	20.9
Belzer	23	13.7	58.8	20.5
Pierce	22	13.7	60.7	20.3
Munich	20	13.3	59.4	19.6
Dilse	22	12.4	62.0	19.4
Kyle	23	12.2	63.0	19.3
Renville	23	13.1	60.4	18.8
AC Napoleon	21	11.0	61.1	18.7
Ben	23	13.7	60.4	18.3
AC Navigator	20	12.3	63.4	17.3
Lebsock	22	12.3	62.1	15.7
average	21.8	12.9	61.0	19.9
p value	0.004	0.335	<0.001	0.005
CV (S/Mean)	5.3	9.6	1.7	9.7
CV(SE/Mean)	3.0	5.5	1.0	5.6
LSD 0.05	1.9	ns	1.7	3.2

x indicates significantly lower yield than check variety, Renville, at a probability of 0.05

Table 6. Relative yielding abilities of durum varieties compared to Renville when grown under dryland conditions in McCone County in cooperation with CES. Cooperator: Victor Wagner

Variety	1998	1999	2000	2001	2002	average	As % of Renville
Mountrail	33.9	30.4	30.5	32.8	21.4	29.8	105.1
Munich	30.0	31.9	32.8	--	19.6	28.6	104.8
AC Morse	31.2	--	29.1	34.2	20.9	28.9	104.2
AC Pathfinder	--	--	--	31.4	22.1	26.8	103.9
Dilse	--	--	--	--	19.4	19.4	103.2
Kyle	35.1	30.5	30.3	29.2	19.3	28.9	101.8
AC Napoleon	--	--	--	33.4	18.7	26.1	101.2
Plaza	28.7	31.3	27.0	34.4	21.9	28.7	101.1
AC Avonlea	--	--	30.9	30.3	22.5	27.9	100.5
Renville	27.5	31.0	31.8	32.7	18.8	28.4	100.0
Pierce	--	--	--	29.7	20.3	25.0	97.1
Belzer	--	--	28.3	30.2	20.5	26.3	94.8
Maier	30.4	26.1	26.2	26.8	22.1	26.3	92.8
Ben	28.9	23.6	26.5	31.2	18.3	25.7	90.6
Lebsock	--	27.4	26.8	30.7	15.7	25.2	88.0
AC Navigator	--	--	--	27.7	17.3	22.5	87.4

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

Table 7. 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	1998	1999	2000	2001	2002	average	As % of Renville
Dilse	--	--	--	--	62.0	62.0	102.6
AC Navigator	--	--	--	62.3	63.4	62.9	101.9
AC Pathfinder	--	--	--	63.5	61.7	62.6	101.5
Maier	62.3	63.7	62.5	64.0	62.2	62.9	101.3
Lebsock	--	63.0	62.8	64.5	62.1	63.1	101.3
Kyle	62.0	63.0	62.8	63.2	63.0	62.8	101.1
Pierce	--	--	--	63.3	60.7	62.0	100.5
Plaza	62.0	62.5	62.5	63.5	61.7	62.4	100.5
Ben	61.8	62.9	62.5	64.0	60.4	62.3	100.3
Renville	61.5	63.0	62.8	63.0	60.4	62.1	100.0
AC Napoleon	--	--	--	62.3	61.1	61.7	100.0
AC Avonlea	--	--	62.3	63.2	60.4	62.0	99.8
Mountrail	62.0	63.0	62.0	62.3	58.6	61.6	99.1
AC Morse	59.8	--	61.8	63.2	60.1	61.2	98.9
Munich	61.3	61.5	62.3	--	59.4	61.1	98.7
Belzer	--	--	61.0	61.2	58.8	60.3	97.2

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

Table 8. Relative protein contents of durum varieties as compared to Renville when grown under dryland conditions in McCone County in cooperation with CES. Cooperator: Victor Wagner

Variety	1998	1999	2000	2001	2002	average	As % of Renville
Pierce	--	--	--	11.1	13.7	12.4	106.4
AC Avonlea	--	--	11.5	11.4	13.3	12.1	105.5
AC Morse	14.9	--	12.1	11.5	13.3	13.0	104.6
Maier	15.6	11.1	11.8	12.1	13.1	12.7	103.9
Belzer	--	--	11.0	10.7	13.7	11.8	103.2
Ben	15.1	10.9	12.4	10.8	13.7	12.6	102.6
Renville	15.2	11.8	11.0	10.2	13.1	12.3	100.0
AC Navigator	--	--	--	11.0	12.3	11.7	100.0
Kyle	14.7	10.9	11.7	11.1	12.2	12.1	98.9
Munich	15.1	11.0	11.1	--	13.3	12.6	98.8
Mountrail	14.4	10.9	10.8	10.2	13.8	12.0	98.0
Lebsock	--	11.4	11.0	9.7	12.3	11.1	96.3
Plaza	15.2	10.0	11.1	10.2	12.5	11.8	96.2
AC Pathfinder	--	--	--	10.0	12.4	11.2	96.1
Dilse	--	--	--	--	12.4	12.4	94.7
AC Napoleon	--	--	--	10.6	11.0	10.8	92.7

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

Table 9. Performance of durum grown under dryland conditions at Wibaux, MT.  
 Planted: 16 May 2002 Harvested: 23 August 2002 Cooperator: David Maus

Variety	Height, inches	Grain protein	Test weight	Yield, bu/acre	
AC Avonlea	23	17.1	60.1	37.2	a
Mountrail	23	16.3	60.0	36.4	a
AC Pathfinder	25	16.2	61.4	35.3	
Pierce	21	16.1	61.4	32.8	
Ben	24	16.6	60.7	31.4	
Lebsock	22	15.8	61.2	30.8	
Maier	23	17.1	61.0	30.0	
Munich	22	17.1	58.5	30.0	
Renville	23	17.2	60.2	28.9	
AC Morse	21	16.9	58.5	28.2	
AC Navigator	21	16.2	62.0	28.0	
Belzer	25	17.2	58.8	27.7	
Dilse	22	17.7	60.1	27.1	
Kyle	23	16.6	61.0	26.5	
AC Napoleon	21	17.0	58.3	25.9	
Plaza	22	17.0	60.9	25.8	
average	23	16.8	60.2	30.1	
p value	0.039	0.064	<0.001	0.018	
CV (S/Mean)	6.5	3.8	0.9	13.6	
CV(SE/Mean)	3.7	2.2	0.5	7.8	
LSD 0.05	2.4	1.1	0.9	6.8	

a indicates significantly greater yield than check variety, Renville, at a probability of 0.05

Table 10. Relative yielding abilities of durum varieties as compared to Renville when grown under dryland conditions in Wibaux County in cooperation with CES. Cooperator: David Maus

Cultivar	1999	2000	2001	2002	Ave	as % of Renville
Mountrail	37.1	48.4	37.7	36.4	39.9	114.3
AC Pathfinder	--	--	38.7	35.3	37.0	112.1
Lebsock	43.5	42.4	39.4	30.8	39.0	111.7
AC Avonlea	--	43.6	38.8	37.2	39.9	111.5
Plaza	40.0	46.4	38.0	25.8	37.6	107.7
Kyle	38.7	44.9	39.2	26.5	37.3	106.9
Maier	38.4	39.3	41.3	30.0	37.3	106.7
Munich	36.5	42.8	--	30.0	36.4	106.6
Pierce	--	--	36.9	32.8	34.9	105.8
Ben	32.3	43.5	38.6	31.4	36.5	104.6
AC Navigator	--	--	40.8	28.0	34.4	104.2
Belzer	--	43.4	38.6	27.7	36.6	103.1
Renville	32.1	41.5	37.0	28.9	34.9	100.0
AC Morse	--	38.4	39.5	28.2	35.4	98.9
AC Napoleon	--	--	36.1	25.9	31.0	94.2
Dilse	--	--	--	27.1	27.1	93.8

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

Table 11. Relative test weights of durum varieties as compared to Renville when grown under dryland conditions in Wibaux County in cooperation with CES. Cooperator: David Maus

Cultivar	1999	2000	2001	2002	Ave	as % of Renville
AC Navigator	--	--	61.3	62.0	61.7	101.8
Lebsock	61.7	62.3	62.7	61.2	62.0	101.6
AC Pathfinder	--	--	61.5	61.4	61.5	101.5
Pierce	--	--	61.3	61.4	61.4	101.3
Kyle	61.5	61.8	61.2	61.0	61.4	100.7
Maier	60.2	62.5	61.8	61.0	61.4	100.7
Ben	60.0	62.8	61.8	60.7	61.3	100.5
Plaza	60.5	62.2	60.7	60.9	61.1	100.2
Renville	60.3	62.3	61.0	60.2	61.0	100.0
Dilse	--	--	--	60.1	60.1	99.8
Mountrail	60.7	62.0	60.0	60.0	60.7	99.5
AC Avonlea	--	62.0	60.5	60.1	60.9	99.5
AC Morse	--	61.5	60.8	58.5	60.3	98.5
Munich	59.0	62.2	--	58.5	59.9	98.4
Belzer	--	60.8	60.8	58.8	60.1	98.2
AC Napoleon	--	--	59.5	58.3	58.9	97.2

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

Table 12. Relative protein contents of durum varieties as compared to Renville when grown under dryland conditions in Wibaux County in cooperation with CES. Cooperator: David Maus

Cultivar	1999	2000	2001	2002	Ave	as % of Renville
Dilse	--	--	--	17.7	17.7	102.9
Maier	14.9	17.4	15.7	17.1	16.3	101.9
AC Avonlea	--	17.2	15.9	17.1	16.7	101.2
Ben	14.8	16.9	16.0	16.6	16.1	100.6
AC Morse	--	16.8	16.1	16.9	16.6	100.6
AC Napoleon	--	--	16.2	17.0	16.6	100.6
Munich	14.5	17.1	--	17.1	16.2	100.6
Renville	14.5	16.5	15.8	17.2	16.0	100.0
Kyle	14.4	16.6	15.5	16.6	15.8	98.8
Belzer	--	16.3	15.2	17.2	16.2	98.2
Plaza	14.4	15.7	15.6	17.0	15.7	98.1
Mountrail	14.2	16.1	16.0	16.3	15.7	98.1
Pierce	--	--	15.9	16.1	16.0	97.0
Lebsock	14.6	16.8	14.8	15.8	15.5	96.9
AC Navigator	--	--	14.9	16.2	15.6	94.5
AC Pathfinder	--	--	15.0	16.2	15.6	94.5

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 13. Performance of durum grown under dryland conditions at Poplar, MT.  
 Planted: 14 May 2002 Harvested: 21 August 2002 Cooperator: Mark Swank

Variety	height, inches	grain protein	test weight	yield, bu/acre
Dilse	37	15.3	61.0	<b>43.7</b>
Lebsock	34	14.2	62.0	43.0
AC Morse	34	15.4	58.7	41.2
Mountrail	36	15.1	60.3	39.9
Maier	35	15.5	60.8	39.5
Pierce	34	14.1	62.0	39.5
Renville	36	14.9	61.5	39.4
Ben	36	14.9	61.0	39.2
AC Avonlea	36	15.5	59.5	38.4
Munich	33	15.6	59.0	38.2
AC Pathfinder	37	14.7	60.5	37.4
AC Napoleon	36	15.0	58.8	37.3
Plaza	28	15.2	58.2	35.7
AC Navigator	32	15.0	59.3	34.8
Kyle	38	15.1	60.0	34.2
Belzer	35	15.2	58.5	33.1
Average	34.8	15.0	60.1	38.4
p value	<0.001	0.013	<0.001	0.049
CV (S/Mean)	4.4	3.0	1.4	9.4
CV(SE/Mean)	2.6	1.8	0.8	5.5
LSD 0.05	2.6	0.8	1.4	6.0

x indicates significantly lower yield than check variety, Renville, at a probability of 0.05

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	1998	1999	2000	2001	2002	Ave	as % of Renville
Dilse	--	--	--	--	43.7	43.7	110.9
AC Morse	--	--	54.5	61.7	41.2	52.5	105.9
Mountrail	38.4	48.6	58.7	61.3	39.9	49.4	105.6
AC Avonlea	--	--	55.8	59.2	38.4	51.1	103.2
Maier	40.0	46.2	54.1	58.3	39.5	47.6	101.8
AC Napoleon	--	--	--	59.5	37.3	48.4	100.5
Lebsock	--	43.7	55.6	56.2	43.0	49.6	100.3
Plaza	35.9	49.5	59.5	53.7	35.7	46.9	100.2
Renville	35.8	49.4	52.3	56.9	39.4	46.8	100.0
Belzer	40.3	--	54.4	54.3	33.1	45.5	98.8
Kyle	39.0	47.8	52.9	54.1	34.2	45.6	97.5
AC Pathfinder	--	--	--	56.5	37.4	47.0	97.5
Ben	41.5	45.3	53.3	47.9	39.2	45.4	97.2
Pierce	--	--	--	53.5	39.5	46.5	96.6
Munich	34.3	45.1	49.0	--	38.2	41.7	94.2
AC Navigator	--	--	--	44.8	34.8	39.8	82.7

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

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

Cultivar	1998	1999	2000	2001	2002	Ave	as % of Renville
Pierce	--	--	--	65.0	62.0	63.5	102.0
Lebsock	--	61.5	63.8	65.2	62.0	63.1	101.7
Dilse	--	--	--	--	61.0	61.0	100.8
Ben	63.3	61.0	63.0	64.7	61.0	62.6	100.5
Maier	62.8	61.0	63.0	64.7	60.8	62.5	100.3
Renville	63.0	61.5	62.3	64.0	60.5	62.3	100.0
AC Pathfinder	--	--	--	64.0	60.5	62.3	100.0
Kyle	62.5	61.5	62.0	64.0	60.0	62.0	99.6
Mountrail	62.2	61.0	62.2	63.7	60.3	61.9	99.4
AC Morse	--	--	62.2	63.5	58.7	61.5	98.7
AC Avonlea	--	--	61.3	63.5	59.5	61.4	98.7
Plaza	61.3	60.8	62.5	64.0	58.2	61.4	98.6
AC Navigator	--	--	--	63.2	59.3	61.3	98.4
Munich	61.8	60.5	62.0	--	59.0	60.8	98.4
Belzer	61.7	--	61.7	63.3	58.5	61.3	98.2
AC Napoleon	--	--	--	63.0	58.8	60.9	97.8

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

Table 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	1998	1999	2000	2001	2002	Ave	as % of Renville
AC Morse	--	--	15.0	13.4	15.4	14.6	103.8
Maier	15.8	13.4	14.7	13.3	15.5	14.5	103.7
AC Avonlea	--	--	14.7	13.4	15.5	14.5	103.3
Dilse	--	--	--	--	15.3	15.3	102.7
Munich	15.7	12.9	14.4	--	15.6	14.7	102.6
AC Napoleon	--	--	--	13.6	15.0	14.3	102.5
AC Navigator	--	--	--	13.6	15.0	14.3	102.5
Ben	15.7	12.6	14.6	13.3	14.9	14.2	101.4
Renville	15.4	12.5	14.3	13.0	14.9	14.0	100.0
Lebsock	--	13.1	14.2	12.9	14.2	13.6	99.5
Belzer	14.8	--	13.8	13.3	15.2	14.3	99.1
Kyle	14.6	12.5	14.0	13.0	15.1	13.8	98.7
Plaza	15.1	12.0	13.5	13.4	15.2	13.8	98.7
Mountrail	15.2	12.5	13.6	12.4	15.1	13.8	98.1
AC Pathfinder	--	--	--	12.6	14.7	13.7	97.8
Pierce	--	--	--	12.9	14.1	13.5	96.8

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 dryland conditions at Reserve, MT.  
 Planted: 15 May 2002 Harvested: 3 September 2002 Cooperator: Max Aasheim

Variety	Height, inches	Grain protein	Test weight	Yield, bu/acre
AC Napoleon	32	14.8	58.8	40.4
Dilse	30	15.6	60.3	37.9
Maier	30	15.3	61.2	37.5
AC Morse	28	15.4	59.0	37.4
Munich	29	15.4	59.0	37.0
AC Avonlea	31	15.3	60.7	36.8
Mountrail	27	14.6	60.7	36.6
AC Pathfinder	29	14.6	60.8	36.6
Lebsock	31	14.7	61.8	35.8
Plaza	29	14.6	59.5	35.5
Renville	30	15.0	60.0	34.3
Pierce	30	14.6	61.3	34.0
Ben	29	15.1	60.8	33.4
Belzer	31	15.0	59.2	33.1
AC Navigator	29	14.6	61.0	30.9
Kyle	31	14.4	60.0	29.9
site average	30	14.9	60.3	35.4
p value	0.490	<0.001	<0.001	0.102
CV (S/Mean)	7.6	1.9	0.7	10.2
CV(SE/Mean)	4.4	1.1	0.4	5.9
LSD <sub>0.05</sub>	ns	0.5	0.7	ns

x indicates significantly lower yield than check variety, Munich, at a probability of 0.05

Table 18. 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	1998	1999	2000	2001	2002	Ave	as % of Renville
Dilse	--	--	--	--	37.9	37.9	110.5
Mountrail	52.6	38.2	32.9	47.0	36.6	41.5	107.5
Plaza	53.2	42.0	34.4	40.3	35.5	41.1	106.5
Munich	46.4	38.6	29.9	--	37.0	38.0	102.4
Maier	49.4	36.8	27.5	44.8	37.5	39.2	101.6
AC Napoleon	--	--	--	39.7	40.4	40.1	101.5
AC Avonlea	--	--	32.7	38.7	36.8	36.1	100.1
Renville	45.8	39.0	29.2	44.6	34.3	38.6	100.0
AC Morse	--	--	28.9	39.5	37.4	35.3	97.9
Belzer	45.9	--	30.3	39.4	33.1	37.2	96.6
Lebsock	--	35.7	24.4	42.9	35.8	34.7	94.4
AC Pathfinder	--	--	--	37.2	36.6	36.9	93.5
Pierce	--	--	--	39.5	34.0	36.8	93.2
Kyle	43.0	38.2	27.4	39.9	29.9	35.7	92.5
Ben	48.2	28.6	26.3	39.6	33.4	35.2	91.3
AC Navigator	--	--	--	33.6	30.9	32.3	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.

Table 19. 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	1998	1999	2000	2001	2002	Ave	as % of Munich
Pierce	--	--	--	64.0	61.3	62.7	101.5
Lebsock	--	63.0	61.8	64.3	61.8	62.7	101.3
Ben	62.7	63.0	61.2	64.8	60.8	62.5	100.8
Dilse	--	--	--	--	60.3	60.3	100.5
AC Navigator	--	--	--	63.0	61.0	62.0	100.4
Maier	62.2	63.3	60.7	63.7	61.2	62.2	100.3
AC Pathfinder	--	--	--	62.8	60.8	61.8	100.1
Plaza	62.0	63.5	61.2	64.0	59.5	62.0	100.0
Renville	62.3	63.5	60.8	63.5	60.0	62.0	100.0
AC Avonlea	--	--	60.5	62.8	60.7	61.3	99.8
Mountrail	61.0	62.8	60.8	63.8	60.7	61.8	99.7
Kyle	61.5	62.5	60.3	63.5	60.0	61.6	99.3
AC Morse	--	--	59.8	63.0	59.0	60.6	98.6
Munich	60.8	63.0	60.2	--	59.0	60.8	98.5
AC Napoleon	--	--	--	62.8	58.8	60.8	98.5
Belzer	60.8	--	59.8	61.3	59.2	60.3	97.8

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

Table 20. Relative proteins of durum varieties as compared to Renville when grown under dryland conditions in Sheridan County in cooperation with CES. Cooperator: Max Aasheim

Cultivar	1998	1999	2000	2001	2002	Ave	as % of Munich
Maier	13.1	11.7	13.7	15.2	15.3	13.8	104.9
Dilse	--	--	--	--	15.6	15.6	104.0
Munich	12.9	11.5	13.2	--	15.4	13.3	103.9
AC Avonlea	--	--	12.9	15.4	15.3	14.5	103.1
AC Morse	--	--	13.3	14.8	15.4	14.5	102.8
Ben	12.8	11.4	13.1	14.4	15.1	13.4	101.5
Renville	12.4	11.1	12.5	14.8	15.0	13.2	100.0
Kyle	12.1	10.8	13.9	14.6	14.1	13.1	99.5
Belzer	12.1	--	12.6	14.7	15.0	13.6	99.5
Lebsock	--	11.5	12.3	14.5	14.7	13.3	99.3
AC Napoleon	--	--	--	14.7	14.8	14.8	99.0
AC Navigator	--	--	--	14.8	14.6	14.7	98.7
Mountrail	12.2	11.4	12.4	14.1	14.6	12.9	98.3
AC Pathfinder	--	--	--	14.6	14.6	14.6	98.0
Pierce	--	--	--	14.5	14.6	14.6	97.7
Plaza	12.3	10.2	12.1	14.5	14.6	12.7	96.8

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.

Table 21. Performance of durum grown under dryland conditions at Nashua, MT.  
Planted: 12 April 2002, Harvested: 19 August 2002 Cooperator: Bill Lauckner

Variety	Height, inches	Grain protein	Test weight	Yield, bu/acre
Plaza	27	12.6	60.2	48.7
AC Avonlea	30	12.0	61.8	48.1
Maier	30	12.8	61.8	47.6
Pierce	30	12.2	62.0	47.2
AC Morse	28	12.8	60.2	47.1
AC Navigator	25	12.1	63.2	46.8
AC Napoleon	32	13.3	58.8	46.1
Kyle	34	12.9	61.0	46.1
Mountrail	30	12.5	60.7	46.0
Lebsock	29	12.6	61.5	45.6
Belzer	30	12.6	59.7	45.5
Dilse	31	12.7	62.0	45.4
Renville	31	13.2	60.3	44.8
AC Pathfinder	30	11.2	62.0	43.7
Ben	31	12.5	61.0	43.6
Munich	28	12.5	60.3	42.6
average	29.6	12.5	61.0	45.9
p value	<0.001	0.421	<0.001	0.708
CV (S/Mean)	4.0	6.8	0.9	7.2
CV(SE/Mean)	2.3	3.9	0.5	4.2
LSD 0.05	2.0	ns	0.9	ns

x indicates significantly lower yield than check variety, Renville, at a probability of 0.05.

Table 22. Relative yielding abilities of spring wheat varieties as compared to McNeal when grown under dryland conditions in Valley County in cooperation with CES.

Cultivar	2000	2001	2002	Ave	As % of Renville
Mountrail	68.6	62.3	46.0	59.0	107.5
AC Avonlea	63.1	59.3	48.1	56.8	103.5
Pierce	--	59.9	47.2	53.6	101.7
Dilse	--	--	45.4	45.4	101.3
Renville	59.3	60.6	44.8	54.9	100.0
Maier	59.0	56.4	47.6	54.3	98.9
Munich	60.0	--	42.6	51.3	98.6
Plaza	60.7	52.4	48.7	53.9	98.2
AC Morse	58.8	55.3	47.1	53.7	97.8
AC Napoleon	--	55.4	46.1	50.8	96.4
Lebsock	53.8	57.9	45.6	52.4	95.4
Belzer	56.6	54.3	45.5	52.1	94.9
AC Pathfinder	--	56.1	43.7	49.9	94.7
Kyle	56.6	52.2	46.1	51.6	94.0
Ben	52.3	54.9	43.6	50.3	91.6
AC Navigator	--	48.3	46.8	47.6	90.3

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

Table 23. Relative test weights of durum varieties as compared to Renville when grown under dryland conditions in Valley County in cooperation with CES.

Cultivar	2000	2001	2002	Ave	As % of Renville
Dilse	--	--	62.0	62.0	102.8
Pierce	--	62.7	62.0	62.4	102.0
Lebsock	64.7	63.0	61.5	63.1	101.9
AC Navigator	--	61.3	63.2	62.3	101.8
Maier	65.0	61.7	61.8	62.8	101.5
AC Pathfinder	--	61.8	62.0	61.9	101.1
Ben	64.0	62.5	61.0	62.5	101.0
Kyle	64.0	62.3	61.0	62.4	100.8
AC Avonlea	63.7	61.8	61.8	62.4	100.8
Munich	64.0	--	60.3	62.2	100.5
Mountrail	64.0	61.7	60.7	62.1	100.3
Renville	63.5	62.0	60.3	61.9	100.0
Plaza	64.7	60.7	60.2	61.9	100.0
AC Morse	63.0	61.7	60.2	61.6	99.5
Belzer	63.2	60.2	59.7	61.0	98.6
AC Napoleon	--	60.7	58.8	59.8	97.7

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

Table 24. Relative protein contents of durum varieties as compared to Renville when grown under dryland conditions in Valley County in cooperation with CES.

Cultivar	2000	2001	2002	Ave	As % of Renville
Renville	9.7	14.6	13.2	12.5	100.0
AC Avonlea	11.5	15.4	12.0	13.0	104.0
AC Morse	11.7	15.2	12.8	13.2	105.6
Maier	11.2	15.4	12.8	13.1	104.8
Ben	11.4	14.7	12.5	12.9	103.2
Lebsock	11.2	14.4	12.6	12.7	101.6
Belzer	10.1	15.2	12.6	12.6	100.8
Kyle	10.5	14.6	12.9	12.7	101.6
Mountrail	10.5	14.2	12.5	12.4	99.2
Plaza	10.1	14.3	12.6	12.3	98.4
AC Napoleon	--	15.4	13.3	14.4	103.6
AC Pathfinder	--	14.6	11.2	12.9	92.8
Pierce	--	14.2	12.2	13.2	95.0
AC Navigator	--	13.8	12.1	13.0	93.5
Munich	11.4	--	12.5	12.0	104.4
Dilse	--	--	12.7	12.7	96.2

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.

Table 25. Performance of durum grown under dryland conditions at Scobey, MT.  
Planted: 15 May 2002 Harvested: 22 August 2002 Cooperator: Bobbie Roos

Variety	Height, inches	Grain protein	Test weight	Yield, bu/acre
Kyle	31	12.0	61.3	<b>38.2</b>
Ben	28	13.7	61.2	35.4
Lebsock	26	12.9	61.8	35.1
AC Pathfinder	27	13.2	62.0	33.7
AC Napoleon	26	12.5	61.2	33.4
Pierce	27	12.7	62.7	33.3
Maier	26	13.2	62.7	33.0
Belzer	29	13.0	60.3	32.9
Mountrail	24	12.2	61.0	32.3
Renville	29	13.0	61.3	31.4
AC Avonlea	27	13.8	60.7	31.1
Dilse	26	14.1	60.8	30.9
AC Navigator	25	13.5	60.2	30.0
Plaza	25	12.4	62.7	29.6
AC Morse	25	13.2	61.0	29.2
Munich	25	14.0	60.5	28.0
site average	26.5	13.1	61.3	32.3
p value	0.001	0.062	0.019	0.228
CV (S/Mean)	6.2	6.1	1.5	12.0
CV(SE/Mean)	3.6	3.5	0.9	6.9
LSD <sub>0.05</sub>	2.7	1.3	1.5	ns

a indicates significantly greater yield than check variety, Renville, at a probability of 0.05

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

Variety	1999	2001	2002	average	As % of Renville
AC Napoleon	--	38.2	33.4	35.8	142.1
AC Morse	--	35.8	29.2	32.5	129.0
AC Pathfinder	--	23.0	33.7	28.4	112.7
Mountrail	50.1	23.5	32.3	35.3	109.6
Kyle	46.5	20.3	38.2	35.0	108.7
Belzer	--	21.9	32.9	27.4	108.7
Ben	45.0	21.0	35.4	33.8	105.0
Pierce	--	19.5	33.3	26.4	104.8
Plaza	43.7	26.8	29.6	33.4	103.7
AC Navigator	--	21.3	30.0	25.7	102.0
Renville	46.3	19.0	31.4	32.2	100.0
AC Avonlea	--	25.1	31.1	28.1	99.6
Dilse	--	--	30.9	30.9	98.4
Maier	41.2	19.4	33.0	31.2	96.9
Lebsock	41.6	16.5	35.1	31.1	96.6
Munich	42.9	--	28.0	35.4	91.2

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

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

Variety	1999	2001	2002	average	As % of Renville
Pierce	--	64.1	62.7	63.4	102.6
Maier	63.1	64.4	62.7	63.4	102.4
Plaza	62.9	64.2	62.7	63.3	102.3
AC Pathfinder	--	64.1	62.0	63.1	102.1
Lebsock	62.8	64.1	61.8	62.9	101.6
Ben	62.9	64.1	61.2	62.7	101.3
AC Morse	--	63.3	61.0	62.2	100.6
AC Navigator	--	63.9	60.2	62.1	100.5
Mountrail	61.7	63.2	61.0	62.0	100.2
Renville	62.2	62.3	61.3	61.9	100.0
Kyle	61.1	63.2	61.3	61.9	100.0
AC Avonlea	--	62.9	60.7	61.8	100.0
AC Napoleon	--	62.4	61.2	61.8	100.0
Belzer	--	63.0	60.3	61.7	99.8
Dilse	--	--	60.8	60.8	99.2
Munich	61.7	--	60.5	61.1	98.9

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

Variety	1999	2001	2002	average	As % of Renville
AC Morse	--	12.2	13.2	12.7	114.4
AC Avonlea	--	10.7	13.8	12.3	110.8
AC Napoleon	--	11.9	12.5	12.2	109.9
Ben	9.4	11.0	13.7	11.4	108.6
Dilse	--	--	14.0	14.0	107.7
AC Navigator	--	10.3	13.5	11.9	107.2
Munich	9.9	--	14.0	12.0	107.2
Maier	9.3	10.4	13.2	11.0	104.8
Pierce	--	9.8	12.7	11.3	101.8
Belzer	--	9.3	13.0	11.2	100.9
AC Pathfinder	--	9.2	13.2	11.2	100.9
Renville	9.3	9.2	13.0	10.5	100.0
Mountrail	9.0	9.9	12.2	10.4	99.0
Plaza	8.8	9.9	12.4	10.4	99.0
Lebsock	9.2	8.7	12.9	10.3	98.1
Kyle	8.4	8.9	12.0	9.8	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 29. Summary of durum yields in bu/acre at two irrigated off-station sites in eastern Montana, 2002. Both sites are sprinkle irrigated.

Variety	Dagmar	Brockton	average
Plaza	48.9	<b>77.6</b>	63.3
Mountrail	<b>49.9</b>	73.1	61.5
Renville	46.4	76.4	61.4
Belzer	47.8	74.1	61.0
Pierce	45.1	76.3	60.7
AC Napoleon	<b>49.9</b>	68.3	59.1
Lebsock	44.9	71.5	58.2
AC Avonlea	48.8	64.5	56.7
AC Morse	46.7	66.0	56.4
Dilse	40.6	71.6	56.1
Ben	46.9	65.2	56.1
Kyle	<b>49.9</b>	56.7	53.3
Maier	39.8	63.6	51.7
Munich	36.9	66.1	51.5
AC Navigator	30	61.1	45.6
AC Pathfinder	31.5	51.3	41.4
CAS-01-447	41.2		
FA-898-782	39.7		
CAS-10-414	24.2		
site average	42.6	67.7	
p value	<0.001	<0.001	
CV (S/Mean)	10.5	9.6	
CV(SE/Mean)	6.0	5.5	
LSD 0.05	7.4	10.8	

Cooperators:

County

Sheridan (Dagmar)  
 Roosevelt (Brockton)  
 Valley (Nashua)

Producer

Steve Brekke  
 Brad Bender  
 Alisha (Zeller) & Cole Sibley

CES agent

Terry Angvick  
 Gina Snyder  
 Verlin Koenig

Table 30. Summary of durum test weights in lb/bu at two irrigated off-station sites in eastern Montana, 2002. Both sites are sprinkle irrigated.

Variety	Dagmar	Brockton	average
Lebsock	59.2	61.3	60.3
Ben	59.3	61.2	60.3
Pierce	57.3	60.8	59.1
Renville	56.8	61.0	58.9
Kyle	58.3	59.3	58.8
Plaza	58.2	58.8	58.5
Dilse	55.8	61.0	58.4
Mountrail	56.8	59.7	58.3
AC Avonlea	57.3	59.0	58.2
AC Napoleon	57.0	58.5	57.8
Maier	56.7	58.5	57.6
AC Morse	55.7	57.7	56.7
Belzer	55.8	56.8	56.3
AC Navigator	53.8	57.5	55.7
Munich	52.8	58.0	55.4
AC Pathfinder	52.2	55.7	54.0
FA-898-782	58.7		
CAS-01-447	57.8		
CAS-10-414	53.0		
site average	56.5	59.1	
p value	<0.001	0.002	
CV (S/Mean)	2.2	2.7	
CV(SE/Mean)	1.3	1.5	
LSD 0.05	2.1	2.6	

Cooperators:

County

Sheridan (Dagmar)  
 Roosevelt (Brockton)  
 Valley (Nashua)

Producer

Steve Brekke  
 Brad Bender  
 Alisha (Zeller) & Cole Sibley

CES agent

Terry Angvick  
 Gina Snyder  
 Verlin Koenig

Table 31. Summary of durum heights in inches at two irrigated off-station sites in eastern Montana, 2002. Both sites are sprinkle irrigated.

Variety	Dagmar	Brockton	average
Kyle	38	37	37.5
Belzer	34	36	35.0
AC Napoleon	34	36	35.0
Renville	32	37	34.5
Pierce	32	36	34.0
AC Avonlea	33	35	34.0
Mountrail	32	35	33.5
AC Pathfinder	32	35	33.5
Ben	31	35	33.0
AC Morse	32	32	32.0
Maier	31	33	32.0
Dilse	29	34	31.5
Lebsock	30	33	31.5
Plaza	30	31	30.5
Munich	29	32	30.5
AC Navigator	29	30	29.5
FA-898-782	32		
CAS-10-414	32		
CAS-01-447	31		
site average	32	34	
p value	<0.001	0.006	
CV (S/Mean)	5.7	6.1	
CV(SE/Mean)	3.3	3.5	
LSD 0.05	3.0	3.5	

Cooperators:

County

Sheridan (Dagmar)  
 Roosevelt (Brockton)  
 Valley (Nashua)

Producer

Steve Brekke  
 Brad Bender  
 Alisha (Zeller) & Cole Sibley

CES agent

Terry Angvick  
 Gina Snyder  
 Verlin Koenig

Table 32. Summary of durum protein contents in percent at two irrigated off-station sites in eastern Montana, 2002. Both sites are sprinkle irrigated.

Variety	Dagmar	Brockton	average
Maier	15.4	15.6	15.5
Munich	15.6	15.1	15.4
Dilse	15.1	15.5	15.3
AC Morse	15.3	15.3	15.3
AC Pathfinder	15.1	15.4	15.3
AC Avonlea	14.9	15.4	15.2
AC Navigator	15.4	14.8	15.1
Renville	14.6	15.0	14.8
Ben	14.8	14.8	14.8
Kyle	14.7	14.6	14.7
AC Napoleon	14.8	14.4	14.6
Mountrail	14.1	15.1	14.6
Belzer	14.6	14.6	14.6
Lebsock	14.4	14.7	14.6
Pierce	14.3	14.5	14.4
Plaza	13.9	13.5	13.7
CAS-10-414	15.9		
CAS-01-447	14.6		
FA-898-782	14.5		
site average	14.8	14.9	
p value	<0.001	<0.001	
CV (S/Mean)	1.8	2.7	
CV(SE/Mean)	1.1	1.6	
LSD 0.05	0.4	0.7	

Cooperators:

County

Sheridan (Dagmar)  
 Roosevelt (Brockton)  
 Valley (Nashua)

Producer

Steve Brekke  
 Brad Bender  
 Alisha (Zeller) & Cole Sibley

CES agent

Terry Angvick  
 Gina Snyder  
 Verlin Koenig

Table 33. Performance of durum grown under irrigated conditions at Dagmar, MT.  
 Planted: 15 May 2002    Harvested: 30 August 2002    Cooperator: Steve Brekke

Variety	height, inches	grain protein	test weight	yield, bu/acre
Kyle	38	14.7	58.3	49.9
Mountrail	32	14.1	56.8	49.9
AC Napoleon	34	14.8	57.0	49.9
Plaza	30	13.9	58.2	48.9
AC Avonlea	33	14.9	57.3	48.8
Belzer	34	14.6	55.8	47.8
Ben	31	14.8	59.3	46.9
AC Morse	32	15.3	55.7	46.7
Renville	32	14.6	56.8	46.4
Pierce	32	14.3	57.3	45.1
Lebsock	30	14.4	59.2	44.9
CAS-01-447	31	14.6	57.8	41.2
Dilse	29	15.1	55.8	40.6
Maier	31	15.4	56.7	39.8
FA-898-782	32	14.5	58.7	39.7
Munich	29	15.6	52.8	36.9 x
AC Pathfinder	32	15.1	52.2	31.5 x
AC Navigator	29	15.4	53.8	30.0 x
CAS-10-414	32	15.9	53.0	24.2 x
average	32	14.8	56.5	42.6
p value	<0.001	<0.001	<0.001	<0.001
CV (S/Mean)	5.7	1.8	2.2	10.5
CV(SE/Mean)	3.3	1.1	1.3	6.0
LSD 0.05	3.0	0.4	2.1	7.4

x indicates significantly lower yield than check variety, Renville, at a probability of 0.05

Table 34. 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	1998	1999	2000	2001	2002	Ave	as % of Renville
AC Napoleon	--	--	--	24.9	49.9	37.4	113.5
Mountrail	72.3	55.4	60.2	26.5	49.9	52.9	109.1
AC Avonlea	--	--	54.5	19.7	48.8	41.0	103.2
Belzer	--	--	49.6	24.7	47.8	40.7	102.4
AC Morse	66.5	--	46.6	22.6	46.7	45.6	101.7
Renville	60.1	62.9	53.3	19.5	46.4	48.4	100.0
Pierce	--	--	--	20.8	45.1	33.0	100.0
Maier	68.8	53.6	54.1	22.9	39.7	47.8	98.7
Plaza	67.3	44.5	56.5	18.2	48.9	47.1	97.2
Lebsock	--	52.6	54.2	24.7	44.9	44.1	96.9
Ben	66.3	51.0	49.0	19.9	46.9	46.6	96.2
Munich	61.4	50.5	50.9	--	36.9	49.9	89.7
CAS-01-447	--	--	--	--	41.2	41.2	88.8
Dilse	--	--	--	--	40.6	40.6	87.5
Kyle	65.1	32.1	44.0	18.6	49.9	41.9	86.6
FA-898-782	--	--	--	--	39.7	39.7	85.6
AC Pathfinder	--	--	--	17.7	31.5	24.6	74.7
AC Navigator	--	--	--	11.6	30.0	20.8	63.1
CAS-10-414	--	--	--	--	24.2	24.2	52.2

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. Severe scab infection in 2001

Table 35. 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	1998	1999	2000	2001	2002	Ave	as % of Renville
FA-898-782	--	--	--	--	58.7	58.7	103.3
Lebsock	--	59.0	63.7	56.9	59.2	59.7	102.0
Ben	63.0	60.0	62.8	56.7	59.3	60.4	101.8
CAS-01-447	--	--	--	--	57.8	57.8	101.8
AC Napoleon	--	--	--	56.1	57.0	56.6	100.3
Maier	62.5	59.3	62.7	55.9	56.7	59.4	100.2
Belzer	--	--	62.0	57.1	55.8	58.3	100.1
Renville	62.3	59.3	62.0	56.0	56.8	59.3	100.0
Kyle	61.8	56.3	61.8	57.8	58.3	59.2	99.9
Mountrail	61.0	60.3	62.3	55.6	56.8	59.2	99.9
AC Avonlea	--	--	60.8	55.3	57.3	57.8	99.2
Plaza	61.5	56.7	62.0	55.5	58.2	58.8	99.2
Dilse	--	--	--	--	55.8	55.8	98.2
Pierce	--	--	56.5	57.6	57.3	57.1	98.1
AC Morse	60.8	--	60.5	54.3	55.7	57.8	97.6
Munich	60.7	58.0	61.8	--	52.8	58.3	97.0
AC Pathfinder	--	--	--	56.5	52.2	54.4	96.4
AC Navigator	--	--	--	53.4	53.8	53.6	95.0
CAS-10-414	--	--	--	--	53.0	53.0	93.3

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. Severe scab infection in 2001

Table 36. 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	1998	1999	2000	2001	2002	Ave	as % of Renville
CAS-10-414	--	--	--	--	15.9	15.9	108.9
AC Navigator	--	--	--	16.4	15.4	15.9	107.1
AC Avonlea	--	--	14.8	16.3	14.9	15.3	106.2
AC Morse	14.0	--	14.6	16.2	15.3	15.0	104.2
Maier	14.4	14.5	14.0	15.4	15.4	14.7	103.5
Dilse	--	--	--	--	15.1	15.1	103.4
Kyle	14.6	14.5	14.3	15.3	14.7	14.7	103.1
AC Pathfinder	--	--	--	15.4	15.1	15.3	102.7
AC Napoleon	--	--	--	15.6	14.8	15.2	102.4
Munich	13.8	14.0	14.0	--	15.6	14.4	102.3
Ben	14.0	13.8	14.3	15.5	14.8	14.5	101.7
Renville	14.4	13.5	13.6	15.1	14.6	14.2	100.0
Pierce	--	--	--	15.4	14.3	14.9	100.0
CAS-01-447	--	--	--	--	14.6	14.6	100.0
FA-898-782	--	--	--	--	14.5	14.5	99.3
Lebsock	--	13.8	13.2	14.6	14.4	14.0	98.6
Mountrail	14.3	13.9	13.0	14.6	14.1	14.0	98.2
Belzer	--	--	13.2	14.7	14.6	14.2	98.2
Plaza	13.1	13.3	13.6	15.9	13.9	14.0	98.0

NOTE: Average protein contents in this summary should not be compared to each other since they are not grown in the same years. Compare only to the check variety. Severe scab infection in 2001.

Table 37. Performance of durum grown under irrigated conditions at Poplar, MT.  
 Planted: 22 May 2002    Harvested: 29 August 2002    Cooperator: Brad Bender

Variety	height, inches	lodging index	grain protein	test weight	yield, bu/acre
Plaza	31	0.7	13.5	58.8	77.6
Renville	37	0.7	15.0	61.0	76.4
Pierce	36	1.7	14.5	60.8	76.3
Belzer	36	2.7	14.6	56.8	74.1
Mountrail	35	1.3	15.1	59.7	73.1
Dilse	34	0.0	15.5	61.0	71.6
Lebsock	33	0.3	14.7	61.3	71.5
AC Napoleon	36	1.0	14.4	58.5	68.3
Munich	32	0.3	15.1	58.0	66.1
AC Morse	32	0.3	15.3	57.7	66.0
Ben	35	1.0	14.8	61.2	65.2
AC Avonlea	35	1.3	15.4	59.0	64.5
Maier	33	0.7	15.6	58.5	63.6
AC Navigator	30	2.3	14.8	57.5	61.1
Kyle	37	5.7	14.6	59.3	56.7
AC Pathfinder	35	1.7	15.4	55.7	51.3
Average	34	1.4	14.9	59.1	67.7
p value	0.006	<0.001	<0.001	0.002	<0.001
CV (S/Mean)	6.1	61.2	2.7	2.7	9.6
CV(SE/Mean)	3.5	35.4	1.6	1.5	5.5
LSD 0.05	3.5	1.4	0.7	2.6	10.8

x indicates significantly lower yield than check variety, Renville, at a probability of 0.05