

**PROJECT TITLE:** Off-station durum yield trials - 2004

**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

**COOPERATORS:**

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

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

Location	Planted	Harvested
Scobey, Daniels County – dryland	May 5	Sep 7
Circle, McCone County – dryland	Apr 26	Aug 17
Poplar, Roosevelt County – dryland	May 6	Aug 30
Reserve, Sheridan County – dryland	May 6	Sep 7
Wibaux, Wibaux County – dryland	Apr 27	Aug 25
Nashua, Valley County – dryland	Apr 16	Aug 20
Nashua, Valley County – flood irrigated	Apr 16	Aug 30

**RESULTS:** Summaries of yields, test weights, heights, hard vitreous amber color, and protein contents across sites are shown in Tables 1-5. MT01695, MT01617, and Mountrail yielded most across dryland sites (Table 1). MT01617 yielded most at the irrigated site (Table 1).

**McCone County:** Performance and relative values of durum varieties at **Circle** are shown in Tables 6-9. Plaza yielded most.

**Wibaux County (dryland):** Performance and relative values of durum varieties at **Wibaux** are shown in Tables 10-13. Kyle and Plaza yielded most.

**Roosevelt County (dryland):** Performance and relative values of durum varieties at **Poplar** are shown in Tables 14-17. MT01695 yielded most.

**Sheridan County (dryland):** Performance and relative values of durum varieties at **Reserve** are shown in Tables 18-21. Ben and Avonlea yielded most.

**Valley County (dryland):** Performances of durum varieties at **Nashua** are shown in Table 22-25. Mountrail yielded most.

**Daniels County (dryland):** Performance and relative values of durum varieties at **Scobey** are shown in Tables 26-29. Renville yielded most.

**Valley County (irrigated):** Performance and relative values of durum varieties at **Nashua** are shown in Tables 30-33. MT01617 yielded most.

**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 seven off-station sites in eastern Montana, 2004.

Variety	Circle, dryland recrop	Wibaux, dryland fallow	Poplar, dryland fallow	Reserve				Nashua, flood irrigated
				, dryland recrop	Nashua, dryland fallow	Scobey, dryland fallow	dryland average	
MT01695	24.2	29.0	<b>53.8</b>	46.4	56.2	64.2	45.6	75.1
MT01617	21.8	28.4	45.7	49.7	55.9	70.5	45.3	<b>87.1</b>
Mountrail	24.6	28.1	47.7	49.2	<b>58.6</b>	61.0	44.9	79.7
Renville	19.9	25.9	44.3	48.2	51.6	<b>75.2</b>	44.2	85.7
Plaza	<b>26.0</b>	30.3	49.7	45.8	54.7	56.7	43.9	83.8
Kyle	22.5	<b>30.4</b>	50.3	49.0	52.4	54.8	43.2	65.3
Avonlea	22.0	27.9	45.1	50.0	51.8	61.3	43.0	84.1
Belzer	22.2	24.6	44.8	45.8	50.5	65.4	42.2	81.2
Maier	22.2	28.8	46.0	49.0	51.9	53.8	41.9	74.3
Ben	21.5	24.1	45.8	<b>50.3</b>	49.7	59.8	41.9	87.1
Munich	22.5	28.5	47.1	46.4	53.7	50.9	41.5	74.7
Lebsock	22.7	25.7	48.5	47.5	52.8	44.4	40.3	78.6
Pathfinder	21.4	25.8	38.1	47.2	48.1	59.0	39.9	82.6
Pierce	20.8	26.5	46.4	48.4	51.1	45.6	39.8	70.1
Dilse	20.5	27.0	42.2	46.2	49.1	51.5	39.4	72.1
Navigator	23.4	23.0	43.8	44.3	50.5	47.8	38.8	62.7
site average	22.4	27.1	46.2	47.7	52.4	57.6		77.8
p value	0.715	0.552	0.477	0.757	0.066	0.01		0.045
CV (S/Mean)	13.9	14.3	13.3	7.6	6.8	16.0		11.8
CV(SE/Mean)	8.0	8.3	7.7	4.4	3.9	9.3		6.8
LSD 0.05	ns	ns	ns	ns	5.9	15.4		15.3

Cooperators:

County

Sheridan (Reserve)

Wibaux (Wibaux)

McCone (Circle)

Roosevelt (Poplar)

Valley (Nashua)

Daniels (Scobey)

Valley Irrigated (Nashua)

Producer

Max Aasheim

David Maus

Victor Wagner

Mark Swank

Bill Lauckner

Bobbie Roos

Alisha (Zeller) & Cole Sibley

CES Agent

Terry Angvick

Dave Bertelsen

Ken Nelson

Gina Snyder

Verlin Koenig

Bobbie Roos

Verlin Koenig

Table 2. Summary of durum test weights in lb/bu at seven sites in eastern Montana, 2004.

Variety	Circle, dryland recrop	Wibaux, dryland fallow	Poplar, dryland fallow	Reserve				Nashua, flood irrigated
				, dryland recrop	Nashua, dryland fallow	Scobey, dryland fallow	dryland average	
MT01617	63.2	62.1	65.3	62.8	63.5	62.7	63.3	64.5
Maier	62.8	60.1	63.8	62.5	62.5	62.5	62.4	63.5
Lebsock	62.4	60.2	64.0	62.3	62.5	62.5	62.3	63.2
Navigator	62.9	60.9	63.7	62.7	63.7	59.7	62.3	63.3
Ben	62.5	60.3	64.0	62.0	62.0	62.2	62.2	63.8
Dilse	62.5	60.1	63.8	62.3	62.5	60.7	62.0	63.3
Pierce	61.7	60.2	63.8	62.3	61.8	61.2	61.8	63.5
Renville	62.0	59.7	63.2	62.0	62.3	60.8	61.7	63.0
Plaza	62.0	60.0	63.3	61.0	61.8	61.8	61.7	62.8
Kyle	62.0	60.2	63.2	62.2	62.3	60.0	61.7	63.7
Pathfinder	62.3	60.1	62.8	61.3	62.0	60.8	61.6	62.7
Avonlea	61.9	59.7	62.8	62.3	62.2	60.3	61.5	63.3
Munich	61.8	59.3	63.2	61.0	61.7	61.7	61.4	62.3
Mountrail	60.8	59.5	63.0	61.3	61.7	61.0	61.2	63.3
Belzer	60.7	58.9	62.7	61.5	61.3	60.8	61.0	62.3
MT01695	61.2	58.8	61.7	61.2	61.5	60.0	60.7	61.7
site average	62.0	60.0	63.4	61.9	62.2	61.2		63.2
p value	0.011	<0.001	<0.001	0.001	<0.001	0.001		77.76
CV (S/Mean)	1.2	0.6	1.0	0.9	0.9	1.4		0.0448
CV(SE/Mean)	0.7	0.3	0.6	0.5	0.5	1.8		11.77
LSD 0.05	1.3	0.6	1.1	0.9	0.9	1.4		6.793

Cooperators:

County

Sheridan (Reserve)

Wibaux (Wibaux)

McCone (Circle)

Roosevelt (Poplar)

Valley (Nashua)

Daniels (Scobey)

Valley Irrigated (Nashua)

Producer

Max Aasheim

David Maus

Victor Wagner

Mark Swank

Bill Lauckner

Bobbie Roos

Alisha (Zeller) & Cole Sibley

CES Agent

Terry Angvick

Dave Bertelsen

Ken Nelson

Gina Snyder

Verlin Koenig

Bobbie Roos

Verlin Koenig

Table 3. Summary of durum heights in inches at seven sites in eastern Montana, 2004.

Variety	Circle, dryland recrop	Wibaux, dryland fallow	Poplar, dryland fallow	Reserve			dryland average	Nashua, flood irrigated
				, dryland recrop	Nashua, dryland fallow	Scobey, dryland fallow		
Kyle	30	31	39	37	39	40	36.0	49
Renville	29	29	37	35	38	40	34.5	48
Ben	28	28	36	33	37	36	32.8	45
Pierce	28	26	36	33	36	35	32.2	40
Belzer	26	27	35	33	36	35	32.2	45
Avonlea	26	29	36	32	35	34	32.0	44
Dilse	26	25	34	31	35	33	30.5	41
Lebsock	28	26	34	30	33	32	30.5	43
Mountrail	27	24	34	31	35	30	30.2	41
Maier	25	26	35	30	33	31	30.0	42
Munich	26	26	31	30	33	29	29.3	39
Pathfinder	26	26	28	28	35	29	28.6	31
Navigator	25	23	28	28	30	32	27.7	33
Plaza	26	22	28	26	29	28	26.5	33
MT01695	24	23	28	26	29	29	26.4	34
MT01617	21	21	26	25	28	27	24.6	33
site average	26.2	25.8	32.9	30.6	20.3	32.3		39.9
p value	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		1.063
CV (S/Mean)	4.3	8.2	4.6	5	4.6	6.7		5
CV(SE/Mean)	2.5	4.8	2.7	2.9	2.6	3.9		67.01
LSD 0.05	1.9	3.5	2.5	2.6	2.6	3.6		38.69

Cooperators:

County

Sheridan (Reserve)

Wibaux (Wibaux)

McCone (Circle)

Roosevelt (Poplar)

Valley (Nashua)

Daniels (Scobey)

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Producer

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Table 4. Summary of durum protein contents in percent at seven sites in eastern Montana, 2004.

Variety	Circle, dryland recrop	Wibaux, dryland fallow	Poplar, dryland fallow	Reserve				Nashua, flood irrigated
				, dryland recrop	Nashua, dryland fallow	Scobey, dryland fallow	dryland average	
Avonlea	14.10	17.98	13.08	13.68	10.99	14.08	13.99	12.36
Dilse	13.87	17.69	13.37	13.72	10.28	14.27	13.87	12.33
Maier	14.00	17.90	13.42	13.31	10.94	13.38	13.83	11.82
Ben	14.07	17.82	13.06	14.04	10.23	13.20	13.74	11.90
Mountrail	13.95	17.33	12.79	13.95	10.33	13.02	13.56	10.52
Pierce	13.88	17.12	12.83	14.14	9.88	13.22	13.51	11.39
Lebsock	14.50	17.24	12.70	13.43	10.08	12.95	13.48	11.48
Navigator	14.01	16.85	11.92	13.60	9.74	13.99	13.35	12.83
Munich	12.69	17.59	12.05	13.77	10.21	13.32	13.27	12.31
Plaza	14.12	17.03	12.24	13.88	9.95	12.10	13.22	11.23
Pathfinder	12.78	17.02	12.54	13.14	9.30	13.31	13.01	11.74
Renville	12.57	17.28	12.11	12.99	8.99	14.11	13.01	11.39
Belzer	13.14	17.07	12.36	12.96	8.74	12.83	12.85	10.22
MT01695	12.87	17.00	11.52	12.93	8.73	12.21	12.54	11.73
site average	13.47	17.21	12.47	13.43	9.71	13.24		11.63
p value	0.125	<0.001	0.208	0.012	<0.001	0.041		63.15
CV (S/Mean)	7.0	1.8	7.0	4	7.0	5.7		3.3
CV(SE/Mean)	4.1	1.0	4.0	2.3	4.0	3.3		0.7058
LSD 0.05	ns	0.51	ns	0.9	1.13	1.26		0.4075

Cooperators:

County

Sheridan (Reserve)

Wibaux (Wibaux)

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Table 5. Summary of durum hard vitreous amber color as percent at seven off-station sites in eastern Montana, 2004.

Variety	Circle, dryland recrop	Wibaux, dryland fallow	Poplar, dryland fallow	Reserve , dryland recrop	Nashua, dryland fallow	Scobey, dryland fallow	dryland average	Nashua, flood irrigated
Avonlea	94.3	100.9	88.7	90.5	87.6	81.3	90.6	78.4
Navigator	91.0	95.6	78.3	92.8	88.3	77.7	87.3	95.3
Dilse	89.1	98.1	87.3	85.1	75.0	86.2	86.8	60.7
Maier	92.0	100.7	87.9	81.3	83.7	73.0	86.4	58.5
Pierce	86.5	99.0	83.7	91.5	70.2	57.0	81.3	56.3
Plaza	82.6	91.8	77.0	83.9	79.8	60.8	79.3	49.8
Pathfinder	76.3	94.4	78.8	78.0	63.0	75.5	77.7	59.3
MT01617	65.5	92.9	86.6	82.4	47.5	90.3	77.5	70.0
Ben	80.0	92.7	73.5	83.4	68.6	60.3	76.4	53.5
Lebsock	80.5	93.9	79.5	74.2	73.3	53.8	75.9	38.9
Mountrail	85.5	98.6	75.5	91.7	90.5	5.5	74.6	27.4
Kyle	85.7	92.4	70.0	80.7	81.6	30.4	73.5	64.2
Belzer	74.9	92.6	71.3	79.9	44.6	72.1	72.6	19.1
Munich	66.5	93.1	56.8	79.5	69.5	61.2	71.1	39.0
site average	81.6	95.4	76.6	83.6	67.6	62.7		54.7
p value	0.002	<0.001	0.042	0.197	<0.001	0.001		<0.001
CV (S/Mean)	9.7	1.8	16.1	10.9	21.2	33.7		21.3
CV(SE/Mean)	5.6	1.1	9.3	6.3	12.3	19.4		3.327
LSD 0.05	13.2	3.2	20.6	ns	23.9	35.2		1.921

Cooperators:

County

Sheridan (Reserve)

Wibaux (Wibaux)

McCone (Circle)

Roosevelt (Poplar)

Valley (Nashua)

Daniels (Scobey)

Valley Irrigated (Nashua)

Producer

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Table 6. Performance of durum grown under dryland continuous cropping conditions at Circle, MT. Planted: Apr 26, 2004 Harvested: Aug 17, 2004 Cooperator: Victor Wagner

Variety	height, inches	HVAC	grain protein	test weight	yield, bu/acre
Plaza	25.5	82.6	14.12	62.0	26.0
Mountrail	26.9	85.5	13.95	60.8	24.6
MT01695	23.6	77.3	12.87	61.2	24.2
Navigator	24.7	91.0	14.01	62.9	23.4
Lebsock	27.6	80.5	14.05	62.4	22.7
Kyle	29.5	85.7	13.42	62.0	22.5
Munich	25.8	66.5	12.69	61.8	22.5
Maier	25.1	92.0	14.00	62.8	22.2
Belzer	26.4	74.9	13.14	60.7	22.2
Avonlea	26.3	94.3	14.10	61.9	22.0
MT01617	20.7	65.5	11.98	63.2	21.8
Ben	27.8	80.0	14.07	62.5	21.5
Pathfinder	26.0	76.3	12.78	62.3	21.4
Pierce	28.3	86.5	13.88	61.7	20.8
Dilse	25.9	89.1	13.87	62.5	20.5
Renville	28.5	77.8	12.57	62.0	19.9
average	26.2	81.6	13.47	62.0	22.4
p value	<0.001	0.002	0.125	0.011	0.715
CV (S/Mean)	4.3	9.7	7.0	1.2	13.9
CV(SE/Mean)	2.5	5.6	4.1	0.7	8.0
LSD 0.05	1.9	13.2	ns	1.3	ns

Table 7. Relative yielding abilities of durum varieties compared to Mountrail when grown under dryland conditions in McCone County in cooperation with CES. Cooperator: Victor Wagner

Variety	2000	2001	2002	2003	2004	average	As % of Mountrail
Plaza	27.0	34.4	21.9	20.4	26.0	25.9	103.1
AC Pathfinder	--	31.4	22.1	20.7	21.4	23.9	100.3
Mountrail	30.5	32.8	21.4	16.5	24.6	25.2	100.0
MT01695	--	--	--	--	24.2	24.2	98.4
Munich	32.8	--	19.6	16.1	22.5	22.8	97.8
AC Avonlea	30.9	30.3	22.5	17.1	22.0	24.6	97.6
Kyle	30.3	29.2	19.3	20.5	22.5	24.4	96.8
Renville	31.8	32.7	18.8	16.3	19.9	23.9	95.0
Belzer	28.3	30.2	20.5	17.9	22.2	23.8	94.7
Pierce	--	29.7	20.3	17.6	20.8	22.1	92.8
Dilse	--	--	19.4	17.9	20.5	19.3	92.5
Ben	26.5	31.2	18.3	18.0	21.5	23.1	91.8
Maier	26.2	26.8	22.1	17.3	22.2	22.9	91.1
AC Navigator	--	27.7	17.3	18.2	23.4	21.7	90.9
MT01617	--	--	--	--	21.8	21.8	88.6
Lebsock	26.8	30.7	15.7	15.3	22.7	22.2	88.4

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 8. Relative test weights of durum varieties as compared to Mountrail when grown under dryland conditions in McCone County in cooperation with CES. Cooperator: Victor Wagner

Variety	2000	2001	2002	2003	2004	average	As % of Mountrail
Dilse	--	--	62.0	60.7	62.5	61.7	105.0
AC Navigator	--	62.3	63.4	60.9	62.9	62.4	104.5
MT01617	--	--	--	--	63.2	63.2	103.9
AC Pathfinder	--	63.5	61.7	60.4	62.3	62.0	103.9
Kyle	62.8	63.2	63.0	60.9	62.0	62.4	103.7
Lebsock	62.8	64.5	62.1	59.7	62.4	62.3	103.6
Maier	62.5	64.0	62.2	59.9	62.8	62.3	103.6
Ben	62.5	64.0	60.4	60.2	62.5	61.9	103.0
Plaza	62.5	63.5	61.7	59.8	62.0	61.9	102.9
Pierce	--	63.3	60.7	59.6	61.7	61.3	102.8
AC Avonlea	62.3	63.2	60.4	60.2	61.9	61.6	102.4
Renville	62.8	63.0	60.4	59.1	62.0	61.5	102.2
Munich	62.3	--	59.4	57.9	61.8	60.4	101.3
MT01695	--	--	--	--	61.2	61.2	100.7
Belzer	61.0	61.2	58.8	59.4	60.7	60.2	100.1
Mountrail	62.0	62.3	58.6	57.0	60.8	60.1	100.0

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

Table 9. Relative protein contents of durum varieties as compared to Mountrail when grown under dryland conditions in McCone County in cooperation with CES. Cooperator: Victor Wagner

Variety	2000	2001	2002	2003	2004	average	As % of Mountrail
Ben	12.4	10.8	13.7	15.4	14.1	13.3	103.0
Maier	11.8	12.1	13.1	14.8	14.0	13.2	102.1
AC Avonlea	11.5	11.4	13.3	14.4	14.1	12.9	100.4
Mountrail	10.8	10.2	13.8	15.7	14.0	12.9	100.0
Pierce	--	11.1	13.7	14.2	13.9	13.2	98.6
Munich	11.1	--	13.3	16.0	12.7	13.3	97.9
Plaza	11.1	10.2	12.5	14.6	14.1	12.5	97.0
Belzer	11.0	10.7	13.7	13.9	13.1	12.5	96.9
Lebsock	11.0	9.7	12.3	15.4	14.0	12.5	96.9
Kyle	11.7	11.1	12.2	13.7	13.4	12.4	96.4
Renville	11.0	10.2	13.1	15.1	12.6	12.4	96.2
AC Navigator	--	11.0	12.3	13.5	14.0	12.7	94.7
Dilse	--	--	12.4	14.8	13.9	13.7	94.5
MT01695	--	--	--	--	12.9	12.9	92.3
AC Pathfinder	--	10.0	12.4	13.9	12.8	12.3	91.5
MT01617	--	--	--	--	12.0	12.0	85.9

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

Table 10. Performance of durum grown under dryland conditions at Wibaux, MT.  
 Planted: Apr 27, 2004      Harvested: Aug 25, 2004      Cooperator: David Maus

Variety	Height, inches	HVA color	Grain protein	Test weight	Yield, bu/acre
Kyle	31.4	101.4	16.84	60.2	30.4
Plaza	22.1	100.8	17.03	60.0	30.3
MT01695	23.1	99.2	17.00	58.8	29.0
Maier	25.7	109.7	17.90	60.1	28.8
Munich	25.9	102.1	17.59	59.3	28.5
MT01617	21.3	101.9	15.63	62.1	28.4
Mountrail	24.0	107.6	17.33	59.5	28.1
Avonlea	28.5	109.9	17.98	59.7	27.9
Dilse	25.2	107.1	17.69	60.1	27.0
Pierce	25.5	108.0	17.12	60.2	26.5
Renville	29.3	108.6	17.28	59.7	25.9
Pathfinder	26.2	103.4	17.02	60.1	25.8
Lebsock	26.2	102.9	17.24	60.2	25.7
Belzer	27.3	101.6	17.07	58.9	24.6
Ben	27.7	101.7	17.82	60.3	24.1
Navigator	22.8	104.6	16.85	60.9	23.0
average	25.8	104.4	17.21	60.0	27.1
p value	<0.001	<0.001	<0.001	<0.001	0.552
CV (S/Mean)	8.2	1.8	1.8	0.6	14.3
CV(SE/Mean)	4.8	1.1	1.0	0.3	8.3
LSD 0.05	3.5	3.2	0.51	0.6	6.5

Table 11. 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	2000	2001	2002	2003	2004	Ave	as % of Mountrail
MT01695	--	--	--	--	29.0	29.0	103.2
MT01617	--	--	--	--	28.4	28.4	101.1
Mountrail	48.4	37.7	36.4	16.8	28.1	33.5	100.0
AC Pathfinder	--	38.7	35.3	18.7	25.8	29.6	99.6
AC Avonlea	43.6	38.8	37.2	19.1	27.9	33.3	99.5
Kyle	44.9	39.2	26.5	17.8	30.4	31.8	94.9
Plaza	46.4	38.0	25.8	16.6	30.3	31.4	93.8
Pierce	--	36.9	32.8	15.4	26.5	27.9	93.8
AC Navigator	--	40.8	28.0	19.1	23.0	27.7	93.2
Lebsock	42.4	39.4	30.8	16.9	25.7	31.0	92.7
Maier	39.3	41.3	30.0	15.1	28.8	30.9	92.3
Ben	43.5	38.6	31.4	15.3	24.1	30.6	91.3
Munich	42.8	--	30.0	15.9	28.5	29.3	90.4
Renville	41.5	37.0	28.9	17.0	25.9	30.1	89.8
Belzer	43.4	38.6	27.7	15.8	24.6	30.0	89.7
Dilse	--	--	27.1	15.6	27.0	23.2	85.7

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 12. 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	2000	2001	2002	2003	2004	Ave	as % of Mountrail
MT01617	--	--	--	--	62.1	62.1	104.4
AC Navigator	--	61.3	62.0	60.5	60.9	61.2	102.7
AC Pathfinder	--	61.5	61.4	61.2	60.1	61.1	102.5
Lebsock	62.3	62.7	61.2	60.9	60.2	61.5	102.3
Ben	62.8	61.8	60.7	59.8	60.3	61.1	101.7
Pierce	--	61.3	61.4	59.2	60.2	60.5	101.6
Maier	62.5	61.8	61.0	59.6	60.1	61.0	101.6
Dilse	--	--	60.1	60.3	60.1	60.2	101.2
Kyle	61.8	61.2	61.0	59.7	60.2	60.8	101.2
Renville	62.3	61.0	60.2	60.0	59.7	60.6	101.0
Plaza	62.2	60.7	60.9	58.8	60.0	60.5	100.8
AC Avonlea	62.0	60.5	60.1	59.6	59.7	60.4	100.5
Mountrail	62.0	60.0	60.0	58.8	59.5	60.1	100.0
Belzer	60.8	60.8	58.8	58.9	58.9	59.6	99.3
Munich	62.2	--	58.5	58.1	59.3	59.5	99.1
MT01695	--	--	--	--	58.8	58.8	98.8

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 13. 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	2000	2001	2002	2003	2004	Ave	as % of Mountrail
Dilse	--	--	17.7	15.1	17.7	16.8	105.6
Munich	17.1	--	17.1	15.1	17.6	16.7	104.7
AC Avonlea	17.2	15.9	17.1	15.1	18.0	16.7	104.3
Maier	17.4	15.7	17.1	14.7	17.9	16.6	103.6
Ben	16.9	16.0	16.6	15.0	17.8	16.5	103.0
Renville	16.5	15.8	17.2	15.1	17.3	16.4	102.5
Kyle	16.6	15.5	16.6	15.6	16.8	16.2	101.5
Belzer	16.3	15.2	17.2	15.1	17.1	16.2	101.3
Pierce	--	15.9	16.1	14.8	17.1	16.0	100.2
Mountrail	16.1	16.0	16.3	14.2	17.3	16.0	100.0
Plaza	15.7	15.6	17.0	14.6	17.0	16.0	100.0
MT01695	--	--	--	--	17.0	17.0	98.3
Lebsock	16.8	14.8	15.8	13.7	17.2	15.7	98.0
AC Pathfinder	--	15.0	16.2	14.1	17.0	15.6	97.6
AC Navigator	--	14.9	16.2	13.6	16.8	15.4	96.4
MT01617	--	--	--	--	15.6	15.6	90.2

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 14. Performance of durum grown under dryland conditions at Poplar, MT.  
 Planted: May 6, 2004    Harvested: Aug 30, 2004    Cooperator: Mark Swank

Variety	height, inches	HVA color	grain protein	test weight	yield, bu/acre
MT01695	28.5	53.2	11.52	61.7	53.8
Kyle	38.8	70.0	11.86	63.2	50.3
Plaza	28.0	77.0	12.24	63.3	49.7
Lebsock	34.4	79.5	12.70	64.0	48.5
Mountrail	34.0	75.5	12.79	63.0	47.7
Munich	31.2	56.8	12.05	63.2	47.1
Pierce	35.6	83.7	12.83	63.8	46.4
Maier	34.9	87.9	13.42	63.8	46.0
Ben	36.1	73.5	13.06	64.0	45.8
MT01617	25.5	86.6	11.66	65.3	45.7
Avonlea	35.7	88.7	13.08	62.8	45.1
Belzer	35.3	71.3	12.36	62.7	44.8
Renville	37.3	76.7	12.11	63.2	44.3
Navigator	28.5	78.3	11.92	63.7	43.8
Dilse	33.7	87.3	13.37	63.8	42.2
Pathfinder	32.9	76.6	12.54	63.4	46.2
Average	32.9	76.6	12.47	63.4	46.2
p value	<0.001	0.042	0.208	<0.001	0.477
CV (S/Mean)	4.6	16.1	7.0	1.0	13.3
CV(SE/Mean)	2.7	9.3	4.0	0.6	7.7
LSD 0.05	2.5	20.6	ns	1.1	ns

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

Cultivar	2000	2001	2002	2003	2004	Ave	as % of Mountrail
MT101695	--	--	--	--	53.8	53.8	112.8
Mountrail	58.7	61.3	39.9	47.4	47.7	51.0	100.0
AC Avonlea	55.8	59.2	38.4	53.0	45.1	50.3	98.6
Dilse	--	--	43.7	46.3	42.2	44.1	97.9
Lebsock	55.6	56.2	43.0	45.0	48.5	49.7	97.4
MT01617	--	--	--	--	45.7	45.7	95.8
Maier	54.1	58.3	39.5	46.0	46.0	48.8	95.6
Plaza	59.5	53.7	35.7	44.4	49.7	48.6	95.3
AC Pathfinder	--	56.5	37.4	54.9	38.1	46.7	95.2
Kyle	52.9	54.1	34.2	45.6	50.3	47.4	93.0
Pierce	--	53.5	39.5	40.6	46.4	45.0	91.7
Renville	52.3	56.9	39.4	40.2	44.3	46.6	91.4
Belzer	54.4	54.3	33.1	44.9	44.8	46.3	90.8
Ben	53.3	47.9	39.2	42.4	45.8	45.7	89.6
AC Navigator	--	44.8	34.8	50.8	43.8	43.6	88.7
Munich	49.0	--	38.2	36.0	47.1	42.6	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 16. Relative test weights of durum varieties as compared to Mountrail when grown under dryland conditions in Roosevelt County in cooperation with CES. Cooperator: Mark Swank

Cultivar	2000	2001	2002	2003	2004	Ave	as % of Mountrail
MT01617	--	--	--	--	65.3	65.3	103.7
Lebsock	63.8	65.2	62.0	64.3	64.0	63.9	102.0
Pierce	--	65.0	62.0	62.8	63.8	63.4	101.2
Dilse	--	--	61.0	64.2	63.8	63.0	101.1
Maier	63.0	64.7	60.8	63.8	63.8	63.2	101.0
Ben	63.0	64.7	61.0	62.4	64.0	63.0	100.7
Renville	62.3	64.0	60.5	63.5	63.2	62.7	100.2
AC Pathfinder	--	64.0	60.5	63.7	62.8	62.8	100.1
AC Navigator	--	63.2	59.3	64.7	63.7	62.7	100.1
Mountrail	62.2	63.7	60.3	63.7	63.0	62.6	100.0
Kyle	62.0	64.0	60.0	63.5	63.2	62.5	99.9
AC Avonlea	61.3	63.5	59.5	63.7	62.8	62.2	99.3
Plaza	62.5	64.0	58.2	62.7	63.3	62.1	99.3
Munich	62.0	--	59.0	62.3	63.2	61.6	98.9
Belzer	61.7	63.3	58.5	62.2	62.7	61.7	98.6
MT101695	--	--	--	--	61.7	61.7	97.9

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

Cultivar	2000	2001	2002	2003	2004	Ave	as % of Mountrail
Maier	14.7	13.3	15.5	12.4	13.4	13.9	105.0
AC Avonlea	14.7	13.4	15.5	12.6	13.1	13.9	105.0
Dilse	--	--	15.3	12.7	13.4	13.8	103.5
Ben	14.6	13.3	14.9	12.3	13.1	13.6	103.3
Munich	14.4	--	15.6	12.9	12.1	13.7	102.5
Renville	14.3	13.0	14.9	12.8	12.1	13.4	101.7
Belzer	13.8	13.3	15.2	12.1	12.4	13.4	101.2
Plaza	13.5	13.4	15.2	12.1	12.2	13.3	100.7
AC Pathfinder	--	12.6	14.7	12.8	12.5	13.2	100.5
AC Navigator	--	13.6	15.0	12.0	11.9	13.1	100.2
Pierce	--	12.9	14.1	12.6	12.8	13.1	100.1
Mountrail	13.6	12.4	15.1	12.1	12.8	13.2	100.0
Kyle	14.0	13.0	15.1	11.7	11.9	13.1	99.5
Lebsock	14.2	12.9	14.2	11.5	12.7	13.1	99.3
MT01617	--	--	--	--	11.7	11.7	91.2
MT101695	--	--	--	--	11.5	11.5	90.1

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 18. Performance of durum grown under dryland conditions at Reserve, MT.  
 Planted: May 6, 2004 Harvested: Sep 7, 2004 Cooperator: Max Aasheim

Variety	height, inches	HVA color	grain protein	test weight	yield, bu/acre
Ben	32.7	83.4	14.04	62.0	50.3
Avonlea	32.4	90.5	13.68	62.3	50.0
MT01617	25.3	82.4	12.43	62.8	49.7
Mountrail	30.7	91.7	13.95	61.3	49.2
Kyle	37.4	80.7	12.86	62.2	49.0
Maier	30.2	81.3	13.31	62.5	49.0
Pierce	32.8	91.5	14.14	62.3	48.4
Renville	34.5	72.6	12.99	62.0	48.2
Lebsock	30.2	74.2	13.43	62.3	47.5
Pathfinder	27.7	78.0	13.14	61.3	47.2
MT01695	26.3	90.0	12.93	61.2	46.4
Munich	30.4	79.5	13.77	61.0	46.4
Dilse	31.0	85.1	13.72	62.3	46.2
Plaza	26.0	83.9	13.88	61.0	45.8
Belzer	33.0	79.9	12.96	61.5	45.8
Navigator	28.5	92.8	13.60	62.7	44.3
site average	30.6	83.6	13.43	61.9	47.7
p value	<0.001	0.197	0.012	0.001	0.757
CV (S/Mean)	5.0	10.9	4.0	0.9	7.6
CV(SE/Mean)	2.9	6.3	2.3	0.5	4.4
LSD <sub>0.05</sub>	2.6	ns	0.90	0.9	ns

Table 19. 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	2000	2001	2002	2003	2004	Ave	as % of Mountrail
MT01617	--	--	--	--	49.7	49.7	101.0
Mountrail	32.9	47.0	36.6	40.1	49.2	41.2	100.0
Dilse	--	--	37.9	38.8	46.2	41.0	97.6
Maier	27.5	44.8	37.5	40.4	49.0	39.8	96.8
AC Avonlea	32.7	38.7	36.8	37.6	50.0	39.2	95.1
Renville	29.2	44.6	34.3	38.5	48.2	39.0	94.7
MT01695	--	--	--	--	46.4	46.4	94.3
Munich	29.9	--	37.0	36.1	46.4	37.4	94.1
AC Pathfinder	--	37.2	36.6	39.6	47.2	40.2	92.9
Plaza	34.4	40.3	35.5	33.2	45.8	37.8	91.9
Lebsock	24.4	42.9	35.8	36.7	47.5	37.5	91.0
Ben	26.3	39.6	33.4	36.7	50.3	37.3	90.5
Belzer	30.3	39.4	33.1	35.0	45.8	36.7	89.2
Pierce	--	39.5	34.0	31.9	48.4	38.5	89.0
Kyle	27.4	39.9	29.9	36.4	49.0	36.5	88.7
AC Navigator	--	33.6	30.9	38.7	44.3	36.9	85.3

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 20. 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	2000	2001	2002	2003	2004	Ave	as % of Mountrail
MT01617	--	--	--	--	62.8	62.8	102.4
Lebsock	61.8	64.3	61.8	61.0	62.3	62.2	101.7
Ben	61.2	64.8	60.8	61.0	62.0	62.0	101.2
AC Navigator	--	63.0	61.0	61.0	62.7	61.9	101.0
Dilse	--	--	60.3	60.5	62.3	61.0	100.9
Maier	60.7	63.7	61.2	60.0	62.5	61.6	100.7
Pierce	--	64.0	61.3	58.7	62.3	61.6	100.4
Renville	60.8	63.5	60.0	60.8	62.0	61.4	100.3
AC Pathfinder	--	62.8	60.8	60.5	61.3	61.4	100.0
Kyle	60.3	63.5	60.0	60.2	62.2	61.2	100.0
Mountrail	60.8	63.8	60.7	59.5	61.3	61.2	100.0
MT01695	--	--	--	--	61.2	61.2	99.8
AC Avonlea	60.5	62.8	60.7	59.2	62.3	61.1	99.8
Plaza	61.2	64.0	59.5	58.3	61.0	60.8	99.3
Munich	60.2	--	59.0	59.0	61.0	59.8	98.7
Belzer	59.8	61.3	59.2	58.3	61.5	60.0	98.0

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

Table 21. 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	2000	2001	2002	2003	2004	Ave	as % of Mountrail
AC Avonlea	12.9	15.4	15.3	16.2	13.7	14.7	105.0
Maier	13.7	15.2	15.3	15.6	13.3	14.6	104.4
Dilse	--	--	15.6	16.0	13.7	15.1	104.1
Munich	13.2	--	15.4	15.1	13.8	14.4	102.9
Ben	13.1	14.4	15.1	14.9	14.0	14.3	102.1
Pierce	--	14.5	14.6	15.6	14.1	14.7	102.1
Belzer	12.6	14.7	15.0	15.8	13.0	14.2	101.6
Plaza	12.1	14.5	14.6	15.6	13.9	14.1	101.0
Kyle	13.9	14.6	14.1	15.1	12.9	14.1	100.9
Renville	12.5	14.8	15.0	14.9	13.0	14.0	100.3
Mountrail	12.4	14.1	14.6	14.9	14.0	14.0	100.0
AC Pathfinder	--	14.6	14.6	15.2	13.1	14.4	99.8
Lebsock	12.3	14.5	14.7	14.5	13.4	13.9	99.1
AC Navigator	--	14.8	14.6	14.1	13.6	14.3	99.1
MT01695	--	--	--	--	12.9	12.9	92.1
MT01617	--	--	--	--	12.4	12.4	88.6

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 22. Performance of durum grown under dryland conditions at Nashua, MT.  
 Planted: Apr 16, 2004    Harvested: Aug 20, 2004    Cooperator: Bill Lauckner

Variety	Height, inches	% HVA color	Grain protein	Test weight	Yield, bu/acre
Mountrail	35.3	90.5	10.33	61.7	58.6
MT01695	28.7	53.8	8.73	61.5	56.2
MT01617	28.0	47.5	8.08	63.5	55.9
Plaza	29.3	79.8	9.95	61.8	54.7
Munich	33.0	69.5	10.21	61.7	53.7
Lebsock	32.7	73.3	10.08	62.5	52.8
Kyle	39.0	81.6	9.85	62.3	52.4 x
Maier	33.0	83.7	10.94	62.5	51.9 x
Avonlea	35.3	87.6	10.99	62.2	51.8 x
Renville	38.0	4.0	8.99	62.3	51.6 x
Pierce	36.3	70.2	9.88	61.8	51.1 x
Navigator	30.0	88.3	9.74	63.7	50.5 x
Belzer	36.3	44.6	8.74	61.3	50.5 x
Ben	36.7	68.6	10.23	62.0	49.7 x
Dilse	34.7	75.0	10.28	62.5	49.1 x
Pathfinder	35.0	63.0	9.30	62.0	48.1 x
average	33.8	67.6	9.71	62.2	52.4
p value	<0.001	<0.001	<0.001	<0.001	0.066
CV (S/Mean)	4.6	21.2	7.0	0.9	6.8
CV(SE/Mean)	2.6	12.3	4.02	0.5	3.9
LSD 0.05	2.6	23.9	1.1	0.9	5.9

x indicates significantly lower yield than check variety, Mountrail

Table 23. Relative yielding abilities of spring wheat varieties as compared to Mountrail when grown under dryland conditions in Valley County in cooperation with CES.

Cultivar	2000	2001	2002	2003	2004	Ave	As % of Mountrail
Mountrail	68.6	62.3	46.0	37.6	58.6	54.6	100.0
MT01695	--	--	--	--	56.2	56.2	95.9
Pierce	--	59.9	47.2	37.8	51.1	49.0	95.8
MT01617	--	--	--	--	55.9	55.9	95.4
AC Avonlea	63.1	59.3	48.1	38.1	51.8	52.1	95.3
Dilse	--	--	45.4	40.8	49.1	45.1	95.1
Maier	59.0	56.4	47.6	41.1	51.9	51.2	93.7
Plaza	60.7	52.4	48.7	36.4	54.7	50.6	92.6
Renville	59.3	60.6	44.8	36.4	51.6	50.5	92.5
Munich	60.0	--	42.6	37.8	53.7	48.5	92.1
AC Pathfinder	--	56.1	43.7	39.0	48.1	46.7	91.4
Lebsock	53.8	57.9	45.6	38.7	52.8	49.8	91.1
Kyle	56.6	52.2	46.1	38.9	52.4	49.2	90.2
AC Navigator	--	48.3	46.8	38.6	50.5	46.1	90.1
Belzer	56.6	54.3	45.5	36.4	50.5	48.7	89.1
Ben	52.3	54.9	43.6	36.2	49.7	47.3	86.7

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

Cultivar	2000	2001	2002	2003	2004	Ave	As % of Mountrail
Dilse	--	--	62.0	62.0	62.5	62.2	102.9
MT01617	--	--	--	--	63.5	63.5	102.9
AC Navigator	--	61.3	63.2	61.5	63.7	62.4	102.8
Lebsock	64.7	63.0	61.5	62.0	62.5	62.7	102.2
Pierce	--	62.7	62.0	60.7	61.8	61.8	101.8
AC Pathfinder	--	61.8	62.0	61.2	62.0	61.8	101.7
Maier	65.0	61.7	61.8	60.8	62.5	62.4	101.6
Ben	64.0	62.5	61.0	61.5	62.0	62.2	101.3
Kyle	64.0	62.3	61.0	61.0	62.3	62.1	101.2
AC Avonlea	63.7	61.8	61.8	60.2	62.2	61.9	100.9
Renville	63.5	62.0	60.3	60.7	62.3	61.8	100.6
Munich	64.0	--	60.3	60.5	61.7	61.6	100.5
Mountrail	64.0	61.7	60.7	58.8	61.7	61.4	100.0
Plaza	64.7	60.7	60.2	59.3	61.8	61.3	99.9
MT01695	--	--	--	--	61.5	61.5	99.7
Belzer	63.2	60.2	59.7	59.8	61.3	60.8	99.1

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

Table 25. Relative protein contents of durum varieties as compared to Mountrail when grown under dryland conditions in Valley County in cooperation with CES.

Cultivar	2000	2001	2002	2003	2004	Ave	As % of Mountrail
AC Avonlea	11.5	15.4	12.0	16.2	11.0	13.2	104.1
Maier	11.2	15.4	12.8	15.4	10.9	13.1	103.5
Ben	11.4	14.7	12.5	15.6	10.2	12.9	101.4
Mountrail	10.5	14.2	12.5	16.0	10.3	12.7	100.0
Munich	11.4	--	12.5	15.0	10.2	12.3	99.6
Plaza	10.1	14.3	12.6	15.9	10.0	12.6	99.1
Lebsock	11.2	14.4	12.6	14.4	10.1	12.5	98.7
Kyle	10.5	14.6	12.9	14.7	9.8	12.5	98.4
Belzer	10.1	15.2	12.6	15.8	8.7	12.5	98.3
Dilse	--	--	12.7	15.1	10.3	12.7	98.2
Renville	9.7	14.6	13.2	15.3	9.0	12.4	97.3
Pierce	--	14.2	12.2	15.2	9.9	12.9	97.2
AC Pathfinder	--	14.6	11.2	15.4	9.3	12.6	95.3
AC Navigator	--	13.8	12.1	13.7	9.7	12.3	93.0
MT01695	--	--	--	--	8.7	8.7	84.5
MT01617	--	--	--	--	8.1	8.1	78.6

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 26. Performance of durum grown under dryland conditions at Scobey, MT.  
 Planted: May 5, 2004 Harvested: Sep 7, 2004 Cooperator: Bobbie Roos

Variety	Height, inches	HVA color	Grain protein	Test weight	Yield, bu/acre
Renville	39.5	84.0	14.11	60.8	75.2
MT01617	26.6	90.3	12.90	62.7	70.5
Belzer	35.0	72.1	12.83	60.8	65.4
MT01695	28.6	34.3	12.21	60.0	64.2
Avonlea	33.6	81.3	14.08	60.3	61.3
Mountrail	30.0	5.5	13.02	61.0	61.0
Ben	35.6	60.3	13.20	62.2	59.8
Pathfinder	28.6	75.5	13.31	60.8	59.0
Plaza	28.1	60.8	12.10	61.8	56.7
Kyle	39.6	30.4	12.95	60.0	54.8
Maier	31.1	73.0	13.38	62.5	53.8
Dilse	32.6	86.2	14.27	60.7	51.5
Munich	29.4	61.2	13.32	61.7	50.9
Navigator	32.0	77.7	13.99	59.7	47.8
Pierce	34.9	57.0	13.22	61.2	45.6
Lebsock	31.7	53.8	12.95	62.5	44.4 x
site average	32.3	62.7	13.24	61.2	57.6
p value	6.7	33.7	5.7	1.4	16.0
CV (S/Mean)	6.7	33.7	5.7	1.4	16.0
CV(SE/Mean)	3.9	19.4	3.3	0.8	9.3
LSD <sub>0.05</sub>	3.6	35.2	1.26	1.4	15.4

x indicates significantly lower yield than check variety, Mountrail, at probability = 0.05

Table 27. 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	2003	2004	average	As % of Mountrail
MT01617	--	--	--	--	70.5	70.5	115.6
MT01695	--	--	--	--	64.2	64.2	105.2
Renville	46.3	19.0	31.4	31.2	75.2	40.6	102.6
Belzer	--	21.9	32.9	29.0	65.4	37.3	100.9
AC Avonlea	--	25.1	31.1	31.5	61.3	37.3	100.7
Mountrail	50.1	23.5	32.3	31.1	61.0	39.6	100.0
AC Pathfinder	--	23.0	33.7	29.4	59.0	36.3	98.1
Kyle	46.5	20.3	38.2	30.1	54.8	38.0	95.9
Ben	45.0	21.0	35.4	27.7	59.8	37.8	95.4
Plaza	43.7	26.8	29.6	30.3	56.7	37.4	94.5
Dilse	--	--	30.9	31.9	51.5	38.1	91.9
Maier	41.2	19.4	33.0	29.9	53.8	35.5	89.5
AC Navigator	--	21.3	30.0	29.9	47.8	32.3	87.2
Munich	42.9	--	28.0	29.9	50.9	37.9	86.9
Lebsock	41.6	16.5	35.1	30.0	44.4	33.5	84.6
Pierce	--	19.5	33.3	25.1	45.6	30.9	83.5

NOTE: Average yields in this summary should not be compared to each other since they are not always grown in the same years. Compare yields only to the check variety. Not harvested in 2000.

Table 28. 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	2003	2004	average	As % of Mountrail
MT01617	--	--	--	--	62.7	62.7	102.8
Maier	63.1	64.4	62.7	63.2	62.5	63.2	102.4
Lebsock	62.8	64.1	61.8	63.3	62.5	62.9	101.9
Plaza	62.9	64.2	62.7	62.5	61.8	62.8	101.8
Ben	62.9	64.1	61.2	63.3	62.2	62.7	101.7
Pierce	--	64.1	62.7	62.4	61.2	62.6	101.4
AC Pathfinder	--	64.1	62.0	63.0	60.8	62.5	101.2
Dilse	--	--	60.8	62.8	60.7	61.4	100.3
Renville	62.2	62.3	61.3	63.0	60.8	61.9	100.3
AC Navigator	--	63.9	60.2	63.5	59.7	61.8	100.2
Munich	61.7	--	60.5	61.8	61.7	61.4	100.1
Mountrail	61.7	63.2	61.0	61.7	61.0	61.7	100.0
Kyle	61.1	63.2	61.3	62.3	60.0	61.6	99.8
AC Avonlea	--	62.9	60.7	61.8	60.3	61.4	99.5
Belzer	--	63.0	60.3	60.7	60.8	61.2	99.1
MT01695	--	--	--	--	60.0	60.0	98.4

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. Not harvested in 2000.

Table 29. 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	2003	2004	average	As % of Mountrail
Dilse	--	--	14.0	12.9	14.3	13.7	111.4
AC Avonlea	--	10.7	13.8	12.6	14.1	12.8	109.2
Munich	9.9	--	14.0	11.9	13.3	12.3	106.7
Ben	9.4	11.0	13.7	12.3	13.2	11.9	106.6
AC Navigator	--	10.3	13.5	11.4	14.0	12.3	104.9
Maier	9.3	10.4	13.2	12.1	13.4	11.7	104.5
Renville	9.3	9.2	13.0	11.9	14.1	11.5	102.9
Pierce	--	9.8	12.7	12.2	13.2	12.0	102.1
AC Pathfinder	--	9.2	13.2	11.9	13.3	11.9	101.5
Belzer	--	9.3	13.0	12.4	12.8	11.9	101.3
Mountrail	9.0	9.9	12.2	11.8	13.0	11.2	100.0
Lebsock	9.2	8.7	12.9	11.8	13.0	11.1	99.5
MT01617	--	--	--	--	12.9	12.9	99.2
Plaza	8.8	9.9	12.4	11.8	12.1	11.0	98.4
Kyle	8.4	8.9	12.0	12.0	13.0	10.9	97.1
MT01695	--	--	--	--	12.2	12.2	93.8

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. Not harvested in 2000.

Table 30. Performance of durum grown under flood irrigated conditions at Nahsua, MT.  
 Planted: Apr 22, 2004 Harvested: Aug 30, 2004 Cooperators: Alisha (Zeller) & Cole Sibley

Variety	height, inches	lodging index	HVA color	grain protein	test weight	yield, bu/acre
MT01617	32.6	0.0	70.0	11.31	64.5	87.1
Ben	44.9	2.0	53.5	11.90	63.8	87.1
Renville	47.9	2.0	38.2	11.39	63.0	85.7
Avonlea	44.5	1.3	78.4	12.36	63.3	84.1
Plaza	33.1	0.0	48.9	11.23	62.8	83.8
Pathfinder	31.1	0.3	59.3	11.74	62.7	82.6
Belzer	44.7	1.0	19.1	10.22	62.3	81.2
Mountrail	40.7	1.7	27.4	10.52	63.3	79.7
Lebsock	42.6	1.3	38.9	11.48	63.2	78.6
MT01695	33.6	0.0	67.7	11.73	61.7	75.1
Munich	39.1	0.7	39.0	12.31	62.3	74.7
Maier	41.6	1.0	58.5	11.82	63.5	74.3
Dilse	40.8	0.7	60.7	12.33	63.3	72.1
Pierce	40.0	0.3	56.3	11.39	63.5	70.1
Kyle	48.6	4.7	64.2	11.57	63.7	65.3
Navigator	33.1	0.0	95.3	12.83	63.3	62.7 x
average	39.9	1.1	54.7	11.63	63.2	77.8
p value	<0.001	<0.001	<0.001	<0.001	<0.001	0.045
CV (S/Mean)	5.0	67.0	21.3	3.3	0.7	11.8
CV(SE/Mean)	2.9	38.7	12.3	1.9	0.4	6.8
LSD 0.05	3.3	1.2	19.5	0.65	0.7	15.3

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

Table 31. Relative yielding abilities of durum varieties as compared to Mountrail when grown under irrigated conditions in Valley County in cooperation with CES. Cooperators: Alisha & Cole Sibley

Variety	2003	2004	average	As % of Mountrail
MT01617	--	87.1	87.1	109.3
Belzer	95.3	81.2	88.3	107.7
Plaza	82.4	83.8	83.1	101.3
Mountrail	84.3	79.7	82.0	100.0
Renville	74.7	85.7	80.2	97.8
Ben	71.0	87.1	79.1	96.5
Avonlea	73.5	84.1	78.8	96.1
Lebsock	78.6	78.6	78.6	95.9
Dilse	83.5	72.1	77.8	94.9
MT01695	--	75.1	75.1	94.2
Pathfinder	69.2	82.6	75.9	91.6
Maier	73.6	74.3	74.0	90.2
Munich	68.6	74.7	71.7	87.4
Navigator	75.6	62.7	69.2	84.4
Pierce	64.4	70.1	67.3	82.1
Kyle	62.0	65.3	63.7	77.7

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 32. Relative test weights of durum varieties as compared to Mountrail when grown under irrigated conditions in Valley County in cooperation with CES. Cooperators: Alisha & Cole Sibley

Variety	2003	2004	average	As % of Mountrail
MT01617	--	64.5	64.5	101.9
Maier	64.2	63.5	63.9	100.3
Ben	63.7	63.8	63.8	100.2
Dilse	64.3	63.3	63.8	100.2
Mountrail	64.0	63.3	63.7	100.0
Lebsock	64.0	63.2	63.6	99.8
Kyle	63.5	63.7	63.6	99.8
Avonlea	63.7	63.3	63.5	99.7
Pierce	63.2	63.5	63.4	99.5
Navigator	63.5	63.3	63.4	99.5
Renville	63.0	63.0	63.0	98.9
Plaza	63.2	62.8	63.0	98.9
Pathfinder	63.2	62.7	63.0	98.9
Belzer	63.3	62.3	62.8	98.6
Munich	63.2	62.3	62.8	98.6
MT01695	--	61.7	61.7	97.5

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 33. Relative protein contents of durum varieties as compared to Mountrail when grown under irrigated conditions in Valley County in cooperation with CES. Cooperators: Alisha & Cole Sibley

Variety	2003	2004	average	As % of Mountrail
Avonlea	13.1	12.4	12.8	114.3
Ben	13.3	11.9	12.6	112.5
Dilse	13.4	12.3	12.5	111.6
Navigator	13.0	12.8	12.5	111.6
MT01695	--	11.7	11.7	111.4
Kyle	13.1	11.6	12.1	108.0
MT01617	--	11.3	11.3	107.6
Pierce	13.0	11.4	12.0	107.1
Renville	12.3	11.4	11.9	106.2
Lebsock	12.2	11.5	11.9	106.2
Pathfinder	12.3	11.7	11.8	105.4
Munich	12.3	12.3	11.8	105.4
Plaza	11.5	11.2	11.7	104.5
Maier	13.1	11.8	11.6	103.6
Mountrail	12.2	10.5	11.2	100.0
Belzer	12.1	10.2	11.0	98.2

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.