PROJECT TITLE: Off-station durum variety evaluations in Montana – 2010 (4W2756)

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Personnel:

Site/County	Producers	CES/AES cooperators
Flaxville, Daniels	Jeff Mohn	Nicole Winkler, CES
Circle, McCone	Victor Wagner	Ken Nelson, CES
Poplar, Roosevelt	Mark Swank	Ann Ronning, CES
Nashua, Valley	Bill Lauckner	Shelley Mills, CES
Wibaux, Wibaux	David Maus	Dave Bertelsen, CES
Outlook, Sheridan	Gordon Stoner	Terry Angvick, CES
Turner, Blaine	Max Cederberg	Gregg Carlson, NARC
North Havre, Hill	Mark Petersen	Gregg Carlson, NARC

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

RESULTS: The site in Wibaux County was not harvested because of severe deer damage. Summaries of yields, test weights, protein contents, NIR hardness, heights and sawfly damage across sites in eastern Montana are shown in Tables 1-6. Experimental line Cimmyt #8 yielded most across sites (Table 1). Cimmyt #8 had greatest test weight across sites (Table 2). Strongfield had greatest protein content across sites (Table 3). Grenora had greatest percent hard vitreous amber color across sites (Table 4). Pierce was tallest and Cimmyt#5was shortest across sites (Table 5). Grenora had greatest percent sawfly cutting and Normanno and Cimmyt#8 had the least percent sawfly cutting across sites (Table 6).

Circle, McCone County: Performances and relative values of yield, test weight, protein, and NIR hardness of durum varieties grown at Circle are shown in Tables 7-11. Five lines and varieties yielded significantly less than the check variety, Mountrail.

Nashua, Valley County: Performances and relative values of yield, test weight, protein and NIR hardness of durum varieties grown at Nashua are shown in Tables 12-16. MT04174 yielded significantly more than the check variety, Mountrail, and Divide yielded significantly less.

Flaxville, Daniels County: Performances of durum varieties grown at Flaxville are shown in Table 17. Alkabo and Cimmyt #8 yielded significantly more than check variety, Mountrail.

Poplar, Roosevelt County: Performances and relative values of yield, test weight, protein and NIR hardness of durum varieties grown at Poplar are shown in Tables 18-22. No lines or varieties yielded significantly more or less than the check variety, Mountrail.

Outlook, Sheridan County: Performances of durum varieties grown at Outlook are shown in Table 23. No lines or varieties yielded significantly more or less than the check variety, Mountrail.

Turner, Blaine County: Performance and relative values of yield, test weight, protein and sawfly damage of durum varieties grown at Turner are shown in Tables 24-28. Ten lines and varieties yielded significantly more than the check variety, Mountrail. Tioga yielded significantly less than the check variety, Mountrail.

North Havre, Hill County: Performance and relative values of yield, test weight, protein and sawfly damage of durum varieties grown at North Havre are shown in Tables 29-33. Grenora yielded significantly more than the check variety, Mountrail.

SUMMARY: Off-station yield trials are conducted at several sites in northern and eastern Montana. All experiments reported under this project are of the replicated small plot type. 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 what varieties to grow based on data from these trials.

FUNDING SUMMARY: Expenditure information to be provided by OSP. No other grants support this project.

MWBC FY2011GRANT SUBMISSION PLANS: It is planned to submit this project for funding consideration in the next fiscal year.

Table 1. Summary of durum yields in bu/acre at seven off-station sites in eastern Montana, 2010.

Variety	Circle, dryland recrop	Nashua, dryland fallow	Flaxville, dryland recrop	Poplar, dryland fallow*	Outlook, dryland recrop	Turner, dryland recrop	N. Havre dryland recrop	average
Alkabo	**15.6**	24.1	**32.7**	35.9	31.3	17.3	62.8	31.4
Pierce	14.4	17.4	26.8	26.0	29.3	15.5	57.2	26.7
Tioga	13.8	21.1	28.1	27.7	26.3	9.4	59.9	26.6
Grenora	9.7	20.4	30.2	34.0	26.4	24.9	**68.0**	30.5
Strongfield	13.9	19.7	22.1	33.5	**33.6**	27.0	64.8	30.7
Divide	13.7	15.6	25.9	27.8	32.1	14.6	52.6	26.0
Alzada	10.7	19.6	22.7	32.8	26.4	28.1	62.5	29.0
Mountrail	14.2	21.4	25.0	36.5	30.7	15.4	57.4	28.6
Normanno	10.9	16.8	23.2	37.5	**33.6**	**33.1**	56.7	30.2
MT01649	6.1	25.7	27.0	45.6	28.5	30.2	61.1	32.0
MT03012	10.9	21.8	21.4	40.0	28.7	26.2	54.4	29.1
MT04174	7.9	**27.0**	25.2	40.5	28.6	28.6	60.8	31.2
Cimmyt#5	9.4	17.7	28.9	40.0	31.0	31.4	63.4	31.7
Cimmyt#8	12.8	25.2	30.9	43.7	32.9	31.6	56.7	**33.4**
Cimmyt#11	12.8	16.9	26.0	**46.1**	31.2	29.8	56.0	31.3
site average	11.8	20.7	26.4	36.5	30.1	24.2	59.6	29.9
probability	<0.001	<0.001	0.005	0.076	0.147	<0.001	0.027	
CV (S/Mean)	17.1	13.7	12.5	16.6	11.6	14.0	8.1	
CV(SE/Mean)	9.8	7.9	7.2	11.7	6.7	8.1	4.7	
LSD 0.05	3.4	4.7	5.5	13.0	5.8	5.7	8.1	

Table 2. Summary of durum test weights in lb/bu at seven sites in eastern Montana, 2010.

Variety	Circle, dryland recrop	Nashua, dryland fallow	Flaxville, dryland recrop	Poplar, dryland fallow	Outlook, dryland recrop	Turner, dryland recrop	N. Havre dryland recrop	average
Alkabo	62.0	57.0	59.5	**57.5**	58.0	57.0	56.9	58.3
Pierce	61.5	56.5	**60.0**	57.0	58.0	56.7	57.1	58.1
Tioga	61.0	56.0	59.5	56.5	57.5	52.9	56.2	57.1
Grenora	60.5	55.0	59.0	55.0	57.0	55.6	56.6	57.0
Strongfield	62.0	55.5	58.5	56.0	57.0	56.0	56.3	57.3
Divide	61.5	56.0	58.5	57.0	57.5	55.2	56.5	57.5
Alzada	61.0	54.0	58.0	57.0	57.5	56.2	**57.7**	57.3
Mountrail	61.5	56.0	58.5	57.0	58.5	56.0	56.5	57.7
Normanno	61.5	55.5	53.5	56.0	55.5	55.8	55.7	56.2
MT01649	57.5	54.0	56.0	55.5	56.5	54.9	54.6	55.6
MT03012	60.0	54.5	56.0	**57.5**	58.0	55.4	55.4	56.7
MT04174	60.5	56.5	57.0	**57.5**	57.0	55.8	56.2	57.2
Cimmyt#5	62.0	56.0	56.0	55.5	57.0	54.9	55.0	56.6
Cimmyt#8	**63.5**	**58.5**	59.0	**57.5**	**59.0**	**57.2**	57.5	**58.9**
Cimmyt#11	61.5	54.5	55.5	56.0	57.5	54.6	54.9	56.4
site average	61.2	55.7	57.6	56.6	57.4	55.6	56.2	57.2

Table 3. Summary of durum percent protein at seven sites in eastern Montana, 2010.

Variety	Circle, dryland recrop	Nashua, dryland fallow	Flaxville, dryland recrop	Poplar, dryland fallow	Outlook, dryland recrop	Turner, dryland recrop	N. Havre dryland recrop	average
Alkabo	12.97	14.57	14.46	14.80	15.29	14.5	13.0	14.23
Pierce	13.20	14.46	14.56	14.46	14.87	15.7	13.8	14.43
Tioga	12.65	14.94	14.94	15.08	15.02	**16.2**	13.7	14.65
Grenora	12.96	**15.00**	14.70	14.57	15.27	14.8	13.1	14.34
Strongfield	12.59	14.73	**15.76**	**15.43**	15.38	15.7	**14.3**	**14.84**
Divide	11.71	14.07	15.03	14.72	14.90	15.9	13.2	14.22
Alzada	12.80	14.17	14.79	14.29	15.04	14.0	13.7	14.11
Mountrail	12.22	14.30	14.87	14.51	14.73	15.4	14.1	14.31
Normanno	12.65	14.16	15.05	14.43	**15.96**	14.3	13.8	14.34
MT01649	14.13	14.23	15.35	14.35	14.53	15.8	**14.3**	14.67
MT03012	14.17	14.83	14.87	14.07	15.54	14.8	13.6	14.55
MT04174	**14.23**	14.03	15.45	14.27	14.92	15.4	13.6	14.56
Cimmyt#5	13.97	13.78	14.84	14.43	14.57	13.6	12.8	14.00
Cimmyt#8	12.40	13.07	14.46	13.98	14.49	13.4	12.9	13.53
Cimmyt#11	12.94	14.64	15.37	14.06	14.61	14.1	13.0	14.10
site average	13.04	14.33	14.97	14.50	15.01	14.9	13.5	14.33

Table 4. Summary of durum percent NIR hardness at five sites in eastern Montana, 2010.

Variety	Circle, dryland recrop	Nashua, dryland fallow	Flaxville, dryland recrop	Poplar, dryland fallow	Outlook, dryland recrop	average
Alkabo	48.0	62.5	85.3	77.2	70.7	68.7
Pierce	55.6	71.1	95.2	82.1	79.0	76.6
Tioga	46.9	**76.5**	96.9	**88.6**	75.9	77.0
Grenora	56.4	73.6	**98.1**	85.8	83.3	**79.4**
Strongfield	52.2	69.1	96.7	87.4	73.8	75.8
Divide	26.6	64.7	92.6	78.1	75.2	67.4
Alzada	59.7	62.4	92.1	83.6	75.5	74.7
Mountrail	44.1	73.0	94.2	86.3	81.5	75.8
Normanno	65.2	75.3	85.6	86.1	82.8	79.0
MT01649	61.7	62.4	88.4	78.5	74.6	73.1
MT03012	**65.4**	71.5	88.2	77.7	**85.4**	77.6
MT04174	61.6	75.5	89.4	81.8	81.0	77.9
Cimmyt#5	63.6	63.7	79.6	76.3	70.9	70.8
Cimmyt#8	55.5	53.1	76.0	75.2	68.2	65.6
Cimmyt#11	54.5	59.3	79.2	77.2	67.9	67.6
site average	54.5	67.6	89.2	81.5	76.4	73.8

Table 5. Summary of durum heights in cm at seven off-station sites in eastern Montana, 2010.

Variety	Circle, dryland recrop	Nashua, dryland fallow	Flaxville, dryland recrop	Poplar, dryland fallow*	Outlook, dryland recrop	Turner, dryland recrop	N. Havre dryland recrop	average
Alkabo	56.0	85.3	67.7	89.5	57.7	69.0	81.7	72.4
Pierce	57.7	88.3	71.3	88.0	68.0	74.9	91.2	77.1
Tioga	61.7	86.7	71.0	82.0	66.3	69.9	95.8	76.2
Grenora	42.7	73.0	64.7	80.0	51.3	66.5	82.7	65.8
Strongfield	57.3	79.3	69.7	82.0	67.3	70.1	84.1	72.8
Divide	56.0	79.7	65.7	81.5	58.0	69.9	86.5	71.0
Alzada	54.3	71.3	62.7	70.5	58.0	63.9	76.6	65.3
Mountrail	57.7	80.7	66.7	87.0	56.3	66.5	80.5	70.8
Normanno	50.0	66.3	57.0	64.5	55.0	58.9	72.5	60.6
MT01649	43.0	58.3	53.0	59.0	51.7	56.6	66.6	55.5
MT03012	50.0	63.0	60.7	68.5	59.3	62.9	74.8	62.8
MT04174	48.3	61.3	55.3	74.0	58.0	65.3	70.9	61.9
Cimmyt#5	42.7	56.3	48.0	62.0	50.3	59.8	68.1	55.3
Cimmyt#8	47.3	60.3	61.0	68.5	56.0	60.2	71.6	60.7
Cimmyt#11	45.7	64.3	58.0	68.5	56.3	61.7	74.2	61.2
site average	51.36	71.6	62.16	75.0	58.0	65.1	78.5	66.0
probability	<0.001	<0.001	<0.001	<0.001	0.006	<0.001	<0.001	
CV (S/Mean)	9.3	6.8	7.6	4.0	9.4	5.8	6.6	
CV(SE/Mean)	5.4	3.9	4.4	2.8	5.4	3.3	3.8	
LSD 0.05	8.0	8.1	7.8	6.5	9.1	6.3	8.6	

Table 6. Summary of percent durum sawfly damage at two off-station sites in eastern Montana, 2010.

Variety	Turner, dryland recrop	N. Havre dryland recrop	average
Alkabo	21.7	1.0	11.3
Pierce	23.3	1.0	12.2
Tioga	21.7	1.0	11.3
Grenora	25.0	1.0	13.0
Strongfield	13.3	1.0	7.2
Divide	18.3	1.0	9.7
Alzada	8.3	1.0	4.7
Mountrail	21.7	1.0	11.3
Normanno	2.3	1.0	1.7
MT01649	6.7	1.0	3.8
MT03012	18.3	3.7	11.0
MT04174	18.3	1.0	9.7
Cimmyt#5	3.7	2.3	3.0
Cimmyt#8	2.3	1.0	1.7
Cimmyt#11	10.0	1.0	5.5
site average	14.3	1.3	7.8
probability	0.003	0.020	
CV (S/Mean)	53.8	65.4	
CV(SE/Mean)	31.1	37.7	
LSD 0.05	12.9	1.4	

Table 7. Performance of durum grown under dryland continuous cropping conditions at Circle, MT. Previous crop was spring wheat. Planted: April 27, 2010 Harvested: August 27, 2010 Cooperator: Victor Wagner

Variety	height, inches	grain protein	HVAC	test weight	yield, bu/acre	
Alkabo	56.0	12.97	48.0	62.0	15.6	
Pierce	57.7	13.20	55.6	61.5	14.4	
Mountrail	57.7	12.22	44.1	61.5	14.2	
Strongfield	57.3	12.59	52.2	62.0	13.9	
Tioga	61.7	12.65	46.9	61.0	13.8	
Divide	56.0	11.71	26.6	61.5	13.7	
Cimmyt#8	47.3	12.40	55.5	63.5	12.8	
Cimmyt#11	45.7	12.94	54.5	61.5	12.8	
Normanno	50.0	12.65	65.2	61.5	10.9	
MT03012	50.0	14.17	65.4	60.0	10.9	
Alzada	54.3	12.80	59.7	61.0	10.7	x
Grenora	42.7	12.96	56.4	60.5	9.7	x
Cimmyt#5	42.7	13.97	63.6	62.0	9.4	x
MT04174	48.3	14.23	61.6	60.5	7.9	x
MT01649	43.0	14.13	61.7	57.5	6.1	x
average	51.36	13.04	54.5	61.2	11.78	
probability	<0.001				<0.001	
CV (S/Mean)	9.3				17.1	
CV(SE/Mean)	5.4				9.8	
LSD 0.05	8.0				3.4	

x indicates significantly lower yield than check variety, Mountrial, at p=0.05

Table 8. Relative yielding abilities of durum varieties compared to Mountrail when grown under dryland conditions in McCone County in cooperation with CES.

Variety	2005	2006	2008	2009	2010	average	As % of Mountrail
Cimmyt #8	--	--	12.1	31.3	12.8	18.7	116.8
Cimmyt #11	--	--	10.9	31.6	12.8	18.4	115.0
Strongfield	--	12.9	11.3	29.0	13.9	16.8	113.2
Normanno	--	--	--	32.8	10.9	21.9	112.3
Alkabo	28.6	13.1	12.0	26.1	15.6	19.1	109.2
Grenora	26.9	13.2	13.3	29.5	9.7	18.5	105.9
Pierce	26.0	12.0	10.8	27.2	14.4	18.1	103.4
MT03012	--	13.7	11.9	24.7	10.9	15.3	103.2
MT04174	--	--	10.7	29.9	7.9	16.2	100.8
Alzada	27.4	13.7	11.5	24.5	10.7	17.6	100.5
Mountrail	28.1	11.2	9.2	24.7	14.2	17.5	100.0
Divide	25.4	11.7	9.8	26.5	13.7	17.4	99.7
Tioga	--	--	--	--	13.8	13.8	97.2
Cimmyt #5	--	--	10.7	25.6	9.4	15.2	95.0
MT01649	--	--	--	22.0	6.1	14.1	72.2

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

Variety	2005	2006	2008	2009	2010	average	As % of Mountrail
Cimmyt #8	--	--	60.7	59.7	63.5	61.3	101.5
Strongfield	--	59.0	61.3	60.2	62.0	60.6	101.4
Pierce	61.8	59.7	61.8	60.0	61.5	61.0	101.4
Alkabo	61.8	59.7	61.0	59.2	62.0	60.7	101.0
Divide	61.0	59.2	61.3	59.0	61.5	60.4	100.4
Alzada	60.0	59.7	60.0	60.5	61.0	60.2	100.2
Mountrail	61.5	58.0	60.2	59.5	61.5	60.1	100.0
MT03012	--	59.7	60.0	58.3	60.0	59.5	99.5
Normanno	--	--	--	58.7	61.5	60.1	99.3
Grenora	61.0	58.5	60.3	58.2	60.5	59.7	99.3
Tioga	--	--	--	--	61.0	61.0	99.2
MT04174	--	--	60.8	58.3	60.5	59.9	99.1
Cimmyt #5	--	--	59.3	57.8	62.0	59.7	98.8
Cimmyt #11	--	--	57.7	57.0	61.5	58.7	97.2
MT01649	--	--	--	57.0	57.5	57.3	94.6

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

Variety	2005	2006	2008	2009	2010	average	As % of Mountrail
MT01649	--	--	--	12.8	14.1	13.5	111.6
MT03012	--	14.6	13.6	12.5	14.2	13.7	104.6
MT04174	--	--	13.4	11.9	14.2	13.2	104.5
Pierce	11.2	14.6	13.5	12.8	13.2	13.1	103.8
Normanno	--	--	--	12.3	12.7	12.5	103.7
Tioga	--	--	--	--	12.6	12.6	103.3
Cimmyt #5	--	--	13.4	11.5	14.0	13.0	102.9
Grenora	11.2	14.3	13.3	12.2	13.0	12.8	101.7
Alkabo	10.6	14.8	13.2	12.4	13.0	12.8	101.7
Mountrail	10.4	14.7	13.7	11.9	12.2	12.6	100.0
Strongfield	--	15.1	13.8	11.0	12.6	13.1	100.0
Divide	10.4	14.6	13.0	12.0	11.7	12.3	98.1
Alzada	10.5	13.7	12.3	11.4	12.8	12.1	96.5
Cimmyt #11	--	--	13.1	10.2	12.9	12.1	95.8
Cimmyt #8	--	--	13.2	10.3	12.4	12.0	95.0

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

Table 11. Relative NIR hardness of durum varieties as compared to Mountrail when grown under dryland conditions in McCone County in cooperation with CES.

Cultivar	2005	2006	2008	2009	2010	Ave	as % of Mountrail
Normanno	--	--	--	50	65	57.5	122.3
MT01649	--	--	--	47	62	54.5	116.0
MT03012	--	79	70	55	65	67.3	113.5
Alzada	69	79	63	55	60	65.2	109.0
Tioga	--	--	--	--	47	47.0	106.8
MT04174	--	--	71	40	62	57.7	106.1
Strongfield	--	86	70	41	52	62.3	105.1
Pierce	54	80	76	44	56	62.0	103.7
Cimmyt #5	--	--	57	43	64	54.7	100.6
Mountrail	62	74	69	50	44	59.8	100.0
Grenora	44	72	64	49	56	57.0	95.3
Alkabo	26	80	58	34	48	49.2	82.3
Divide	40	76	63	39	27	49.0	81.9
Cimmyt #8	--	--	57	16	56	43.0	79.1
Cimmyt #11	--	--	45	26	54	41.7	76.7

NOTE: Average NIR hardness 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.

Table 12. Performance of durum grown under dryland fallow conditions at Nashua, MT.
Planted: Apr 24, 2010 Harvested: August 26, 2010 Cooperator: Bill Lauckner

Variety	height, inches	grain protein, %	HVAC	Test wt, lb/bu	Yield, bu/acre	
MT04174	61.3	14.03	75.5	56.5	27.0	a
MT01649	58.3	14.23	62.4	54.0	25.7	
Cimmyt#8	60.3	13.07	53.1	58.5	25.2	
Alkabo	85.3	14.57	62.5	57.0	24.1	
MT03012	63.0	14.83	71.5	54.5	21.8	
Mountrail	80.7	14.30	73.0	56.0	21.4	
Tioga	86.7	14.94	76.5	56.0	21.1	
Grenora	73.0	15.00	73.6	55.0	20.4	
Strongfield	79.3	14.73	69.1	55.5	19.7	
Alzada	71.3	14.17	62.4	54.0	19.6	
Cimmyt#5	56.3	13.78	63.7	56.0	17.7	
Pierce	88.3	14.46	71.1	56.5	17.4	
Cimmyt#11	64.3	14.64	59.3	54.5	16.9	
Normanno	66.3	14.16	75.3	55.5	16.8	
Divide	79.7	14.07	64.7	56.0	15.6	x
average	71.6	14.33	67.6	55.7	20.7	
probability	<0.001				<0.001	
CV (S/Mean)	6.8				13.7	
CV(SE/Mean)	3.9				7.9	
LSD 0.05	8.1				4.7	

a indicates significantly greater yield than check variety, Mountrail, at p = 0.05
x indicates significantly lower yield than check variety, Mountrail, at p = 0.05

Table 13. Relative yielding abilities of durum varieties as compared to Mountrail when grown under dryland conditions in Valley County in cooperation with CES.

Cultivar	2005	2006	2008	2009	2010	Ave	As % of Mountrail
Cimmyt #8	--	--	16.5	31.5	25.2	24.4	113.3
MT04174	--	--	19.2	26.1	27.0	24.1	111.9
Alkabo	59.3	28.5	16.2	26.4	24.1	30.9	107.1
MT01649	--	--	--	24.8	25.7	25.3	106.5
Grenora	57.7	32.2	15.4	26.7	20.4	30.5	105.7
Strongfield	--	33.5	14.9	30.3	19.7	24.6	103.9
Divide	61.0	29.1	16.3	26.1	15.6	29.6	102.7
Alzada	48.2	27.5	20.0	31.0	19.6	29.3	101.5
MT03012	--	28.8	19.1	25.0	21.8	23.7	100.0
Mountrail	49.5	30.1	17.2	26.0	21.4	28.8	100.0
Pierce	48.9	32.1	16.3	28.6	17.4	28.7	99.4
Tioga	--	--	--	--	21.1	21.1	98.6
Normanno	--	--	--	29.9	16.8	23.4	98.5
Cimmyt #11	--	--	16.8	28.5	16.9	20.7	96.3
Cimmyt #5	--	--	16.9	25.1	17.7	19.9	92.4

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

Cultivar	2005	2006	2008	2009	2010	Ave	As % of Mountrail
Cimmyt #8	--	--	57.2	61.5	58.5	59.1	102.9
Pierce	62.5	60.3	58.5	60.2	56.5	59.6	101.8
Alkabo	61.7	60.0	58.8	60.0	57.0	59.5	101.6
Divide	61.0	60.0	58.0	59.8	56.0	59.0	100.7
Strongfield	--	60.0	57.0	60.5	55.5	58.3	100.6
MT04174	--	--	56.5	59.8	56.5	57.6	100.3
Mountrail	61.3	59.3	56.5	59.7	56.0	58.6	100.0
Tioga	--	--	--	--	56.0	56.0	100.0
Grenora	61.8	59.8	56.8	59.0	55.0	58.5	99.9
Normanno	--	--	--	59.7	55.5	57.6	99.6
MT03012	--	59.7	56.3	59.8	54.5	57.6	99.5
Cimmyt #5	--	--	55.2	59.5	56.0	56.9	99.1
Alzada	58.5	59.0	56.5	60.0	54.0	57.6	98.4
Cimmyt #11	--	--	54.3	59.5	54.5	56.1	97.7
MT01649	--	--	--	58.8	54.0	56.4	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 15. Relative protein contents of durum varieties as compared to Mountrail when grown under dryland conditions in Valley County in cooperation with CES.

Cultivar	2005	2006	2008	2009	2010	Ave	As % of Mountrail
Tioga	--	--	--	--	14.9	14.9	104.2
Strongfield	--	13.6	16.8	14.1	14.7	14.8	102.1
MT03012	--	14.1	15.7	14.0	14.8	14.7	101.0
Grenora	11.1	13.2	15.9	14.8	15.0	14.0	100.9
Pierce	10.6	14.0	16.2	14.4	14.5	13.9	100.4
Mountrail	11.4	12.9	16.4	14.4	14.3	13.9	100.0
Alkabo	10.6	13.2	15.8	14.1	14.6	13.7	98.4
MT04174	--	--	15.8	14.4	14.0	14.7	98.0
Normanno	--	--	--	13.8	14.2	14.0	97.6
MT01649	--	--	--	13.8	14.2	14.0	97.6
Alzada	11.4	12.7	15.3	13.7	14.2	13.5	97.0
Divide	10.6	12.4	15.6	14.6	14.1	13.5	97.0
Cimmyt #11	--	--	16.5	11.3	14.6	14.1	94.0
Cimmyt #5	--	--	15.4	13	13.8	14.1	93.6
Cimmyt #8	--	--	15.9	11.9	13.1	13.6	90.7

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 16. Relative NIR hardness of durum varieties as compared to Mountrail when grown under dryland conditions in Valley County in cooperation with CES.

Cultivar	2005	2006	2008	2009	2010	Ave	as % of Mountrail
Alzada	62	60	70	84	62	67.6	117.0
Pierce	37	66	79	76	71	65.8	113.8
Grenora	51	53	74	73	74	65.0	112.5
MT03012	--	71	76	80	72	74.8	110.3
Strongfield	--	68	76	76	69	72.3	106.6
Tioga	--	--	--	--	76	76.0	104.1
MT04174	--	--	78	78	76	77.3	103.1
Normanno	--	--	--	78	75	76.5	101.3
Mountrail	18	46	74	78	73	57.8	100.0
Divide	33	33	70	72	65	54.6	94.5
MT01649	--	--	--	78	62	70.0	92.7
Cimmyt #5	--	--	66	73	64	67.7	90.2
Alkabo	5	49	74	66	62	51.2	88.6
Cimmyt #8	--	--	68	72	53	64.3	85.8
Cimmyt #11	--	--	59	63	59	60.3	80.4

NOTE: Average NIR hardness 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.

Table 17. Performance of durum grown under dryland recrop conditions at Flaxville, MT. Previous crop was spring wheat. Planted: May 24, 2010 Harvested: October 12, 2010 Cooperator: Jeff Mohn

variety	height, cm	percent protein	HVAC	test wt, lb/bu	yield, bu/ac	
Alkabo	67.7	14.46	85.3	59.5	32.7	a
Cimmyt#8	61.0	14.46	76.0	59.0	30.9	a
Grenora	64.7	14.70	98.1	59.0	30.2	
Cimmyt#5	48.0	14.84	79.6	56.0	28.9	
Tioga	71.0	14.94	96.9	59.5	28.1	
MT01649	53.0	15.35	88.4	56.0	27.0	
Pierce	71.3	14.56	95.2	60.0	26.8	
Cimmyt#11	58.0	15.37	79.2	55.5	26.0	
Divide	65.7	15.03	92.6	58.5	25.9	
MT04174	55.3	15.45	89.4	57.0	25.2	
Mountrail	66.7	14.87	94.2	58.5	25.0	
Normanno	57.0	15.05	85.6	53.5	23.2	
Alzada	62.7	14.79	92.1	58.0	22.7	
Strongfield	69.7	15.76	96.7	58.5	22.1	
MT03012	60.7	14.87	88.2	56.0	21.4	
site average	62.16	14.97	89.2	57.6	26.4	
probability	<0.001				0.005	
CV (S/Mean)	7.6				12.5	
CV(SE/Mean)	4.4				7.2	
LSD 0.05	7.8				5.5	

a indicates significantly greater yield than check variety, Mountrail, at p=0.05

Table 18. Performance of durum grown under dryland fallow conditions at Poplar, MT.
Planted: May 24, 2010 Harvested: October 8, 2010 Cooperator: Mark Swank

Variety	height, cm	grain protein, %	NIR hardness	test wt, lb/bu	yield, bu/ac
Cimmyt#11	68.5	14.06	77.2	56.0	46.1
MT01649	59.0	14.35	78.5	55.5	45.6
Cimmyt#8	68.5	13.98	75.2	57.5	43.7
MT04174	74.0	14.27	81.8	57.5	40.5
MT03012	68.5	14.07	77.7	57.5	40.0
Cimmyt#5	62.0	14.43	76.3	55.5	40.0
Normanno	64.5	14.43	86.1	56.0	37.5
Mountrail	87.0	14.51	86.3	57.0	36.5
Alkabo	89.5	14.80	77.2	57.5	35.9
Grenora	80.0	14.57	85.8	55.0	34.0
Strongfield	82.0	15.43	87.4	56.0	33.5
Alzada	70.5	14.29	83.6	57.0	32.8
Divide	81.5	14.72	78.1	57.0	27.8
Tioga	82.0	15.08	88.6	56.5	27.7
Pierce	88.0	14.46	82.1	57.0	26.0
Average	75.0	14.50	81.5	56.6	36.5
probability	<0.001				0.076
CV (S/Mean)	4.0				16.6
CV(SE/Mean)	2.8				11.7
LSD 0.05	6.5				13.0

Table 19. Relative yields of durum varieties as compared to Mountrail when grown under dryland conditions in Roosevelt County in cooperation with CES.

Cultivar	2004	2005	2006	2009	2010	Ave	as % of Mountrail
Cimmyt #11	--	--	--	54.7	46.1	50.4	113.1
Cimmyt #8	--	--	--	56.5	43.7	50.1	112.5
MT01649	--	--	--	51.9	45.6	48.8	109.4
Cimmyt #5	--	--	--	54.0	40.0	47.0	105.5
Strongfield	--	--	21.1	60.9	33.5	38.5	104.2
Grenora	--	37.9	21.1	62.3	34.0	38.8	102.2
MT03012	--	--	21.8	51.2	40.0	37.7	102.0
Mountrail	47.7	41.2	21.7	52.6	36.5	39.9	100.0
MT04174	--	--	--	48	40.5	44.3	99.3
Alkabo	--	41.0	22.5	51.4	35.9	37.7	99.2
Normanno	--	--	--	50.7	37.5	44.1	99.0
Alzada	--	42.1	25.4	49.0	32.8	37.3	98.2
Divide	--	37.2	21.4	57.4	27.8	36.0	94.6
Pierce	46.4	38.4	20.8	54.2	26.0	37.2	93.0
Tioga	--	--	--	--	27.7	27.7	75.9

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

Cultivar	2004	2005	2006	2009	2010	Ave	as % of Mountrail
MT03012	--	--	53.3	61.7	57.5	57.5	101.5
Divide	--	60.3	53.3	62.7	57.0	58.3	101.4
Alkabo	--	60.2	53.0	62.5	57.5	58.3	101.4
Cimmyt #8	--	--	--	62.5	57.5	60.0	101.0
Pierce	63.8	59.3	52.5	63.2	57.0	59.2	101.0
MT04174	--	--	--	61.7	57.5	59.6	100.3
Alzada	--	58.0	53.2	62.2	57.0	57.6	100.2
Mountrail	63.0	60.0	51.2	61.8	57.0	58.6	100.0
Strongfield	--	--	50.7	62.2	56.0	56.3	99.4
Tioga	--	--	--	--	56.5	56.5	99.1
Cimmyt #11	--	--	--	61.3	56.0	58.7	98.7
Grenora	--	59.3	51.0	61.3	55.0	56.7	98.5
Normanno	--	--	--	60.7	56.0	58.4	98.2
Cimmyt #5	--	--	--	60.0	55.5	57.8	97.2
MT01649	--	--	--	59.7	55.5	57.6	97.0

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

Table 21. Relative proteins of durum varieties as compared to Mountrail when grown under dryland conditions in Roosevelt County in cooperation with CES.

Cultivar	2004	2005	2006	2009	2010	Ave	as % of Mountrail
MT01649	--	--	--	11.8	14.4	13.1	104.8
Cimmyt #5	--	--	--	11.8	14.4	13.1	104.8
Tioga	--	--	--	--	15.1	15.1	104.1
Strongfield	--	--	19.6	10.8	15.4	15.3	104.1
MT04174	--	--	--	11.3	14.3	12.8	102.4
Alkabo	--	15.1	19.4	11.0	14.8	15.1	100.8
Pierce	12.8	15.8	18.7	11.0	14.5	14.6	100.3
Mountrail	12.8	15.8	19.0	10.5	14.5	14.5	100.0
Normanno	--	--	--	10.6	14.4	12.5	100.0
Cimmyt #11	--	--	--	10.6	14.1	12.4	98.8
Grenora	--	15.3	18.0	11.1	14.6	14.8	98.7
Cimmyt #8	--	--	--	10.5	14.0	12.3	98.0
MT03012	--	--	17.7	11.2	14.1	14.3	97.7
Divide	--	15.1	17.9	10.3	14.7	14.5	97.0
Alzada	--	14.4	17.0	11.1	14.3	14.2	95.0

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 22. Relative NIR hardness of durum varieties as compared to Mountrail when grown under dryland conditions in Roosevelt County in cooperation with CES.

Cultivar	2004	2005	2006	2009	2010	Ave	as % of Mountrail
Strongfield	--	--	78	94	87	86.3	104.0
Tioga	--	--	--	--	89	89.0	103.5
Pierce	84	93	76	92	82	85.4	102.9
MT03012	--	--	81	91	78	83.3	100.4
Mountrail	76	90	73	90	86	83.0	100.0
Grenora	--	90	74	89	86	84.8	100.0
Alzada	--	88	72	94	84	84.5	99.7
Normanno	--	--	--	88	86	87.0	98.9
Alkabo	--	91	75	90	77	83.3	98.2
MT04174	--	--	--	90	82	86.0	97.7
Divide	--	92	72	83	78	81.3	95.9
MT01649	--	--	--	86	78	82.0	93.2
Cimmyt #5	--	--	--	85	76	80.5	91.5
Cimmyt #8	--	--	--	85	75	80.0	90.9
Cimmyt #11	--	--	--	82	77	79.5	90.3

NOTE: Average NIR hardness 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.

Table 23. Performance of durum grown under dryland recrop conditions at Outlook, MT. Previous crop was lentils. Planted: May 24, 2010 Harvested: October 12, 2010 Cooperator: Gordon Stoner

Variety	height, cm	grain protein, %	NIR hardness	test wt, lb/bu	yield, bu/acre
Strongfield	67.3	15.38	73.8	57.0	33.6
Normanno	55.0	15.96	82.8	55.5	33.6
Cimmyt#8	56.0	14.49	68.2	59.0	32.9
Divide	58.0	14.90	75.2	57.5	32.1
Alkabo	57.7	15.29	70.7	58.0	31.3
Cimmyt#11	56.3	14.61	67.9	57.5	31.2
Cimmyt#5	50.3	14.57	70.9	57.0	31.0
Mountrail	56.3	14.73	81.5	58.5	30.7
Pierce	68.0	14.87	79.0	58.0	29.3
MT03012	59.3	15.54	85.4	58.0	28.7
MT04174	58.0	14.92	81.0	57.0	28.6
MT01649	51.7	14.53	74.6	56.5	28.5
Grenora	51.3	15.27	83.3	57.0	26.4
Alzada	58.0	15.04	75.5	57.5	26.4
Tioga	66.3	15.02	75.9	57.5	26.3
site average	58.0	15.01	76.4	57.4	30.1
probability	0.006				0.147
CV (S/Mean)	9.4				11.6
CV(SE/Mean)	5.4				6.7
$LSD_{0.05}$	9.1				5.8

Table 24. Performance of durum grown under dryland conditions at Turner, MT.
Planted: May 17, 2010 Harvested: Oct 1, 2010 Cooperator: Max Cederberg

Variety	Height, inches	sawfly rating	grain protein, %	Test weight	Yield, bu/acre	
Normanno	58.9	2.3	14.3	55.8	33.1	a
Cimmyt#8	60.2	2.3	13.4	57.2	31.6	a
Cimmyt#5	59.8	3.7	13.6	54.9	31.4	a
MT01649	56.6	6.7	15.8	54.9	30.2	a
Cimmyt#11	61.7	10.0	14.1	54.6	29.8	a
MT04174	65.3	18.3	15.4	55.8	28.6	a
Alzada	63.9	8.3	14.0	56.2	28.1	a
Strongfield	70.1	13.3	15.7	56.0	27.0	a
MT03012	62.9	18.3	14.8	55.4	26.2	a
Grenora	66.5	25.0	14.8	55.6	24.9	a
Alkabo	69.0	21.7	14.5	57.0	17.3	
Pierce	74.9	23.3	15.7	56.7	15.5	
Mountrail	66.5	21.7	15.4	56.0	15.4	
Divide	69.9	18.3	15.9	55.2	14.6	
Tioga	69.9	21.7	16.2	52.9	9.4	x
average	65.1	14.3	14.9	55.6	24.2	
probability	<0.001	0.003		<0.001	<0.001	
CV (S/Mean)	5.8	53.8		1.4	14.0	
CV(SE/Mean)	3.3	31.1		0.8	8.1	
LSD 0.05	6.3	12.9		1.3	5.7	

a indicates significantly greater yield than check variety, Mountrail at p=0.05
x indicates significantly lower yield than check variety, Mountrail at p=0.05

Table 25. Relative yielding abilities of durum varieties as compared to Mountrail when grown under dryland conditions at Turner, MT.

Cultivar	2006	2007	2008	2009	2010	Ave	as % of Mountrail
Normanno	--	--	--	40.9	33.1	37.0	145.7
Cimmyt#8	--	--	21.9	36.3	31.6	29.9	135.9
Cimmyt#11	--	--	20.6	34.6	29.8	28.3	128.6
Cimmyt#5	--	--	17.2	36.3	31.4	28.3	128.4
Strongfield	21.6	24.0	19.4	36.5	27.0	25.7	119.8
MT01649	--	--	--	30.5	30.2	30.4	119.5
Alzada	23.7	25.2	17.1	29.1	28.1	24.6	114.8
MT04174	--	--	15.3	31.9	28.6	25.3	114.7
MT03012	21.7	24.3	16.5	33.0	26.2	24.3	113.4
Grenora	19.1	25.6	15.4	35.4	24.9	24.1	112.2
Mountrail	18.9	22.3	15.3	35.4	15.4	21.5	100.0
Alkabo	18.4	22.5	14.8	31.9	17.3	21.0	97.8
Pierce	17.6	20.0	14.8	32.9	15.5	20.2	93.9
Divide	17.9	20.0	17.2	29.9	14.6	19.9	92.8
Tioga	--	--	--	--	9.4	9.4	61.0

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 26. Relative test weights of durum varieties as compared to Mountrail when grown under dryland conditions Turner, MT.

Cultivar	2006	2007	2008	2009	2010	Ave	as % of Mountrail
Cimmyt#8	--	--	58.1	62.3	57.2	59.2	102.2
Alkabo	58.5	57.5	57.4	60.8	57.0	58.2	101.7
Pierce	57.3	57.6	57.0	60.9	56.7	57.9	101.2
Alzada	57.0	56.1	57.4	60.6	56.2	57.5	100.4
Divide	57.3	56.7	57.3	60.0	55.2	57.3	100.1
Strongfield	56.7	56.1	57.5	59.9	56.0	57.2	100.0
Mountrail	56.3	56.1	57.6	60.2	56.0	57.2	100.0
Grenora	57.0	55.7	56.5	60.6	55.6	57.1	99.7
MT04174	--	--	57.2	60.1	55.8	57.7	99.6
Normanno	--	--	--	59.8	55.8	57.8	99.5
MT03012	57.3	55.0	56.9	60.1	55.4	56.9	99.5
Cimmyt#5	--	--	56.6	60.3	54.9	57.3	98.8
Cimmyt#11	--	--	55.7	59.7	54.6	56.7	97.8
MT01649	--	--	--	58.7	54.9	56.8	97.8
Tioga	--	--	--	--	52.9	52.9	94.5

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 27. Relative protein contents of durum varieties as compared to Mountrail when grown under dryland conditions Turner, MT.

Cultivar	2007	2008	2009	2010	Ave	as % of Mountrail
MT01649	--	--	16.2	15.9	16.1	106.6
Tioga	--	--	--	16.2	16.2	105.2
Strongfield	19.8	16.2	15.7	15.7	16.9	104.3
MT04174	--	15.8	15.7	15.4	15.6	102.0
Pierce	18.3	16.1	15.4	15.7	16.4	101.2
Divide	18.2	15.6	15.7	15.9	16.4	101.2
Mountrail	19.0	15.6	14.8	15.4	16.2	100.0
MT03012	18.7	15.5	15.5	14.8	16.1	99.4
Alzada	17.8	15.3	15.9	14.0	15.8	97.5
Alkabo	17.8	15.0	15.2	14.5	15.6	96.3
Grenora	17.4	15.4	14.7	14.8	15.6	96.3
Normanno	--	--	14.5	14.3	14.4	95.4
Cimmyt#11	--	14.2	14.0	14.1	14.1	92.2
Cimmyt#5	--	14.2	14.0	13.6	13.9	90.8
Cimmyt#8	--	14.0	13.4	13.4	13.6	88.9

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 28. Relative sawfly damage of durum varieties as compared to Mountrail when grown under dryland conditions Turner, MT.

Cultivar	2006	2007	2008	2009	2010	Ave	as % of Mountrail
Grenora	50.0	33.3	21.7	15.0	25.0	29.0	124.4
Pierce	43.3	21.7	26.7	11.7	23.3	25.3	108.7
Alkabo	48.3	25.0	18.3	8.7	21.7	24.4	104.6
Mountrail	48.3	25.0	13.3	8.3	21.7	23.3	100.0
Tioga	--	--	--	--	21.7	21.7	100.0
MT04174	--	--	4.0	8.7	18.3	10.3	71.6
Divide	26.7	13.3	8.3	5.0	18.3	14.3	61.4
Strongfield	16.7	10.0	10.0	10.0	13.3	12.0	51.5
MT03012	11.7	11.7	11.7	5.7	18.3	11.8	50.7
Alzada	20.0	6.7	10.0	8.3	8.3	10.7	45.7
MT01649	--	--	--	5.3	6.7	6.0	40.0
Cimmyt#11	--	--	2.3	2.3	10.0	4.9	33.7
Cimmyt#5	--	--	1.0	2.3	3.7	2.3	16.2
Normanno	--	--	--	0.7	2.3	1.5	10.0
Cimmyt#8	--	--	1.0	1.0	2.3	1.4	9.9

NOTE: Average sawfly damage 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.

Table 29. Performance of durum grown under dryland conditions at North Havre, MT.
Planted: May 3, 2010 Harvested: Sep 2+6, 2010 Cooperator: Mark Peterson

Variety	Height, cm	sawfly rating	grain protein, %	Test weight	Yield, bu/acre	
Grenora	82.7	1.0	13.1	56.6	**68.0**	a
Strongfield	84.1	1.0	14.3	56.3	64.8	
Cimmyt#5	68.1	2.3	12.8	55.0	63.4	
Alkabo	81.7	1.0	13.0	56.9	62.8	
Alzada	76.6	1.0	13.7	57.7	62.5	
MT01649	66.6	1.0	14.3	54.6	61.1	
MT04174	70.9	1.0	13.6	56.2	60.8	
Tioga	95.8	1.0	13.7	56.2	59.9	
Mountrail	80.5	1.0	14.1	56.5	57.4	
Pierce	91.2	1.0	13.8	57.1	57.2	
Normanno	72.5	1.0	13.8	55.7	56.7	
Cimmyt#8	71.6	1.0	12.9	57.5	56.7	
Cimmyt#11	74.2	1.0	13.0	54.9	56.0	
MT03012	74.8	3.7	13.6	55.4	54.4	
Divide	86.5	1.0	13.2	56.5	52.6	
average	78.5	1.3	13.5	56.2	59.6	
probability	<0.001	0.020		<0.001	0.027	
CV (S/Mean)	6.6	65.4		1.0	8.1	
CV(SE/Mean)	3.8	37.7		0.6	4.7	
LSD 0.05	8.6	1.4		0.9	8.1	

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

Table 30. Relative yielding abilities of durum varieties as compared to Mountrail when grown under dryland conditions at North Havre, MT.

Cultivar	2006	2007	2008	2009	2010	Ave	as % of Mountrail
Cimmyt#5	--	--	48.2	39.8	63.4	50.5	118.1
MT04174	--	--	45.7	35.6	60.8	47.4	110.8
Cimmyt#8	--	--	49.3	34.8	56.7	46.9	109.8
MT01649	--	--	--	36.3	61.1	48.7	106.3
Strongfield	13.6	46.3	38.5	37.7	64.8	40.2	106.1
Cimmyt#11	--	--	43.9	35.4	56.0	45.1	105.5
Normanno	--	--	--	39.4	56.4	47.9	104.6
Tioga	--	--	--	--	59.9	59.9	104.4
Alzada	18.3	44.0	39.6	31.6	62.5	39.2	103.5
MT03012	18.2	40.0	46.4	31.7	54.4	38.1	100.7
Mountrail	16.0	45.1	36.6	34.2	57.4	37.9	100.0
Grenora	15.8	40.9	39.9	34.5	58.0	37.8	99.9
Divide	15.7	42.1	37.8	35.8	52.6	36.8	97.2
Alkabo	16.4	43.7	33.5	24.2	62.8	36.1	95.4
Pierce	12.6	40.7	33.4	31.8	57.2	35.1	92.8

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 31. Relative test weights of durum varieties as compared to Mountrail when grown under dryland conditions North Havre, MT.

Cultivar	2006	2007	2008	2009	2010	Ave	as % of Mountrail
Cimmyt#8	--	--	61.9	60.9	57.5	60.1	103.4
Pierce	52.6	59.2	60.2	60.0	57.1	57.8	102.3
Alzada	52.5	58.6	59.4	60.2	57.7	57.7	102.1
Alkabo	52.9	58.5	60.1	59.9	56.9	57.7	102.0
Divide	54.5	58.1	59.3	59.5	56.5	57.6	101.9
MT03012	53.8	57.5	60.8	58.7	55.4	57.2	101.3
MT04174	--	--	61.3	58.7	56.2	58.7	101.1
Strongfield	52.8	57.1	59.8	59.3	56.3	57.1	101.0
Mountrail	51.8	56.5	59.4	58.4	56.5	56.5	100.0
Cimmyt#5	--	--	60.7	58.5	55.0	58.1	99.9
Grenora	51.6	57.6	60.1	56.2	56.6	56.4	99.8
Tioga	--	--	--	--	56.2	56.2	99.5
Normanno	--	--	--	57.6	55.7	56.7	98.6
Cimmyt#11	--	--	59.1	56.5	54.9	56.8	97.8
MT01649	--	--	--	56.7	54.6	55.7	96.9

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 32. Relative protein contents of durum varieties as compared to Mountrail when grown under dryland conditions North Havre, MT.

Cultivar	2007	2008	2009	2010	Ave	as % of Mountrail
Mountrail	16.7	14.7	14.7	14.1	15.1	100.0
Strongfield	16.8	13.7	15.3	14.3	15.0	99.3
MT01649	--	--	13.9	14.3	14.1	97.9
Divide	15.8	15.3	14.6	13.2	14.7	97.4
Normanno	--	--	14.1	13.8	14.0	97.2
Tioga	--	--	--	13.7	13.7	97.2
MT03012	16.5	13.7	14.6	13.6	14.6	96.7
Alzada	15.4	13.7	15.4	13.7	14.6	96.7
Alkabo	16.1	14.7	14.3	13.0	14.5	96.0
Pierce	15.5	14.4	14.1	13.8	14.5	96.0
Grenora	16.2	14.0	14.2	13.1	14.4	95.4
MT04174	--	13.8	14.0	13.6	13.8	95.2
Cimmyt#5	--	13.2	13.5	12.8	13.2	91.0
Cimmyt#11	--	12.7	13.3	13.0	13.0	89.7
Cimmyt#8	--	12.0	12.9	12.9	12.6	86.9

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 33. Relative sawfly damage of durum varieties as compared to Mountrail when grown under dryland conditions North Havre, MT.

Cultivar	2006	2007	2008	2009	2010	Ave	as % of Mountrail
MT01649	--	--	--	1.0	1.0	1.0	153.8
Alkabo	48.3	11.7	15.0	0.3	1.0	15.3	118.1
Grenora	50.0	10.0	11.7	0.0	1.0	14.5	112.5
Dilse	50.0	--	8.3	0.7	1.0	15.0	100.7
Mountrail	48.3	5.0	10.0	0.3	1.0	12.9	100.0
Pierce	43.3	5.3	8.3	0.3	1.0	11.6	90.1
Normanno	--	--	--	0.0	1.0	0.5	76.9
Divide	26.7	4.0	3.7	0.0	1.0	7.1	54.8
MT04174	--	--	3.7	1.0	1.0	1.9	50.4
Alzada	20.0	2.3	2.3	0.0	1.0	5.1	39.6
MT03012	11.7	5.0	2.3	0.3	3.7	4.6	35.6
Strongfield	16.7	1.0	2.3	0.0	1.0	4.2	32.5
Cimmyt#5	--	--	0.7	0.0	2.3	1.0	26.5
Cimmyt#11	--	--	1.0	0.0	1.0	0.7	17.7
Cimmyt#8	--	--	0.7	0.0	1.0	0.6	15.0

NOTE: Average sawfly damage 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.