PROJECT TITLE: Evaluation of spring wheat, durum, and barley varieties under minimum-till, continuous cropping conditions – 2010 (4W2756)

PRINCIPAL INVESTIGATOR:
Joyce Eckhoff, Eastern Agricultural Research Center, 1501 N Central Ave, Sidney, MT 59270
phone: (406)433-2208 e-mail: jeckhoff@sidney.ars.usda.gov

OBJECTIVE: To determine the best adapted varieties of spring wheat, durum, and barley for production under no-till continuous cropping conditions in eastern Montana.

Methods:
Soil type: Williams clay loam
Previous crops: 2009- spring wheat, 2008- safflower, 2007 - small grain plots
Residual soil N to 3 ft: 18 lb/bu, residual soil P to 6 in: 41ppm
Applied fertilizer: 60 lb N/ac
Herbicides: Brox M, 1.5 pt/ac, applied June 15
Precipitation April – August, 2010: 15.32 in, average (61 yr) precipitation April – August: 9.48 in
Precipitation September 2009 – August 2010: 20.25 in, average (61 yr) precipitation September – August: 13.90 in

Comments:
It was generally a cool and very wet summer.

Experiment	Planting date	Harvest date	Plot size
recrop spring wheat	Apr 23	Aug 10	100 ft^2, entire plot harvested
recrop durum	Apr 23	Aug 11	100 ft^2, entire plot harvested
recrop barley	Apr 23	Aug 10	100 ft^2, entire plot harvested

RESULTS:
Spring wheat: Twenty lines and varieties of spring wheat were tested under dryland recrop conditions (Table 1). Six varieties yielded significantly less than the check variety, Vida. Five-year summaries for yield, test weight, height, and protein content are shown in Tables 2 through 5.

Durum: Sixteen durum lines and varieties were tested under dryland recrop conditions (Table 6). No lines or varieties yielded significantly differently than the check variety, Mountrail. Five-year summaries for yield, test weight, height, protein content, and hard vitreous amber color are shown in Tables 7 through 11.

Barley: Sixteen barley lines and varieties were tested under dryland recrop conditions. (Table 12). One experimental line yielded significantly greater than the check variety, Haxby. Five-year summaries for yield, test weight, height, and protein content are shown in Tables 2 through 5.

SUMMARY: The experiments reported under this project are all of the replicated small plot type. The three-year crop rotation is commercial small grain, small grain yield trials, safflower.

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

MWBC FY2011 GRANT SUBMISSION PLANS: It is planned to submit this project for funding consideration in the next fiscal year.

Table 1. Agronomic data obtained from a dryland recrop spring wheat yield trial conducted at the Eastern Agricultural Research Center, Sidney, MT.

entry	heading*	height, cm	height, in	grain protein, %	test wt, lb/bu	yield, bu/ac	
Vida	65.0	73.3	28.9	12.55	60.0	53.8	
Granger	64.0	77.3	30.4	11.98	60.5	51.3	
MT 0832	61.7	70.7	27.8	11.01	59.5	49.4	
Barlow	63.3	73.0	28.7	10.89	61.5	48.8	
MT 0827	62.3	73.3	28.9	11.67	62.0	48.7	
Outlook	65.3	72.3	28.5	11.84	59.5	47.6	
Mott	64.3	73.0	28.7	12.58	60.0	46.9	
Reeder	64.3	71.7	28.2	13.19	61.5	46.9	
MT 0852	63.3	70.7	27.8	12.41	61.5	46.8	
Ap604CL	63.0	74.7	29.4	12.05	59.5	45.1	
Faller	65.7	73.0	28.7	11.95	60.0	44.7	
Briggs	61.3	80.0	31.5	11.98	61.0	44.6	
Oneal	64.0	68.3	26.9	12.39	60.5	43.9	
Corbin	62.7	70.7	27.8	11.79	59.5	43.7	
Choteau	63.7	69.3	27.3	11.52	60.5	43.2	x
Kelby	62.0	65.3	25.7	13.52	61.5	42.6	x
Kuntz	63.7	68.3	26.9	11.97	60.5	41.6	x
Jedd	62.0	59.3	23.4	10.34	61.0	40.8	x
McNeal	65.0	74.0	29.1	11.70	60.0	40.1	x
Volt	65.0	67.3	26.5	11.16	61.0	37.8	x
mean	63.6	71.3	28.1	11.92	60.6	45.4	
Probability	<0.001	0.003				0.324	
CV (S/mean)	1.0	6.4				13.9	
CV (SE/mean)	0.6	3.7				8.0	
LSD 0.05	1.1	7.5				10.4	

*days from planting
x indicates significantly lower yield than check variety, McNeal, at probability of <0.05

Table 2. Relative yielding abilities of spring wheat varieties in bu/ac as compared to Vida when grown under dryland continuous cropping at the EARC, Sidney, Montana.

Cultivar	2006	2007	2008	2009	2010	Ave	as % of Vida
Vida	37.6	38.1	6.3	29.8	53.8	33.1	100.0
MT0832	--	--	--	--	49.4	49.4	91.8
Outlook	35.2	40.4	6.5	21.7	47.6	30.3	91.4
MT0827	--	--	--	--	48.7	48.7	90.5
Granger	--	--	6.7	22.7	51.3	26.9	89.8
Reeder	35.7	35.9	7.9	21.9	46.9	29.7	89.6
O'Neal	--	--	8.7	27.6	43.9	26.7	89.2
Barlow	--	--	--	24.7	48.8	36.8	87.9
MT0852	--	--	--	--	46.8	46.8	87.0
Faller	--	--	4.9	27.8	44.7	25.8	86.1
Briggs	--	--	7.2	22.5	44.6	24.8	82.6
McNeal	35	28.2	8.4	24.5	40.1	27.2	82.2
Choteau	35.2	29.5	7.7	20.0	43.2	27.1	81.9
AP604CL	--	--	--	21.6	45.1	33.4	79.8
Jedd	--	--	8.5	20.2	40.8	23.2	77.3
Volt	--	--	8.0	23.4	37.8	23.1	77.0
Mott	--	--	--	16.1	46.9	31.5	75.4
Kelby	--	--	6.7	17.6	42.6	22.3	74.4
Kuntz	--	--	7.2	17.2	41.6	22.0	73.4
Corbin	--	--	6.7	12.6	43.7	21.0	70.1

NOTE: Average yields 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 3. Relative test weights of spring wheat varieties in lb/bu as compared to Vida when grown under dryland continuous cropping at the EARC, Sidney, Montana.

Cultivar	2006	2007	2008	2009	2010	Ave	as % of Vida
MT0827	--	--	--	--	62.0	62.0	103.3
Jedd	--	--	59.3	63.3	61.0	61.2	103.3
Barlow	--	--	--	63.5	61.5	62.5	102.7
MT0852	--	--	--	--	61.5	61.5	102.5
Kelby	--	--	58.8	61.7	61.5	60.7	102.4
Volt	--	--	56.0	63.5	61.0	60.2	101.6
Choteau	59.5	62.8	56.8	61.5	60.5	60.2	101.4
AP604CL	--	--	--	63.5	59.5	61.5	101.1
Reeder	58.0	62.0	57.0	61.3	61.5	60.0	101.0
O'Neal	--	--	56.3	62.5	60.5	59.8	100.9
Briggs	--	--	56.5	61.7	61.0	59.7	100.8
Kuntz	--	--	56.2	62.0	60.5	59.6	100.6
Vida	57.2	62.0	56.0	61.7	60.0	59.4	100.0
Corbin	--	--	56.5	61.0	59.5	59.0	99.6
Granger	--	--	54.8	61.7	60.5	59.0	99.6
Mott	--	--	--	60.7	60.0	60.4	99.2
MT0832	--	--	--	--	59.5	59.5	99.2
Faller	--	--	52.2	61.5	60.0	57.9	97.7
McNeal	56.0	61.2	51.7	60.0	60.0	57.8	97.3
Outlook	55.5	60.5	52.0	60.3	59.5	57.6	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 only to the check variety.

Table 4. Relative heights of spring wheat varieties in inches as compared to Vida when grown under dryland continuous cropping at the EARC, Sidney, Montana.

Cultivar	2006	2007	2008	2009	2010	Ave	as % of Vida
Briggs	--	--	20	19	32	23.7	107.6
Barlow	--	--	--	20	29	24.5	104.3
Vida	27	30	19	18	29	24.6	100.0
Granger	--	--	19	17	30	22.0	100.0
MT0827	--	--	--	--	29	29.0	100.0
O'Neal	--	--	20	18	27	21.7	98.5
Outlook	28	30	18	17	28	24.2	98.4
McNeal	26	29	19	18	29	24.2	98.4
AP604CL	--	--	--	17	29	23.0	97.9
Mott	--	--	--	17	29	23.0	97.9
MT0832	--	--	--	--	28	28.0	96.6
MT0852	--	--	--	--	28	28.0	96.6
Kelby	--	--	19	18	26	21.0	95.5
Faller	--	--	16	18	29	21.0	95.5
Reeder	26	28	18	16	28	23.2	94.3
Corbin	--	--	18	16	28	20.7	93.9
Choteau	26	28	17	16	27	22.8	92.7
Volt	--	--	18	17	26	20.3	92.4
Kuntz	--	--	18	16	27	20.3	92.4
Jedd	--	--	16	16	23	18.3	83.3

NOTE: Average heights 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 5. Relative protein contents of spring wheat varieties in percent as compared to Vida when grown under dryland continuous cropping at the EARC, Sidney, Montana.

Cultivar	2006	2007	2008	2009	2010	Ave	as % of Vida
Kelby	--	--	16.6	18.6	13.5	16.2	105.4
Reeder	15.1	15.7	17.1	19.2	13.2	16.1	105.0
Corbin	--	--	17.1	19.1	11.8	16.0	103.9
Mott	--	--	--	18.2	12.6	15.4	101.3
Vida	15.3	15.0	15.8	17.8	12.6	15.3	100.0
Briggs	--	--	15.3	18.2	12.0	15.2	98.5
MT0852	--	--	--	--	12.4	12.4	98.4
Kuntz	--	--	15.5	17.6	12.0	15.0	97.6
AP604CL	--	--	--	17.6	12.0	14.8	97.4
Outlook	15.0	14.1	14.8	18.4	11.8	14.8	96.9
Granger	--	--	15.4	17.1	12.0	14.8	96.3
Faller	--	--	15.8	16.0	12.0	14.6	94.8
Barlow	--	--	--	17.9	10.9	14.4	94.7
Volt	--	--	15.8	16.7	11.2	14.6	94.6
O'Neal	--	--	14.8	16.4	12.4	14.5	94.4
MT0827	--	--	--	--	11.7	11.7	92.9
Choteau	13.3	12.4	15.4	17.7	11.5	14.1	91.9
Jedd	--	--	14.5	17.2	10.3	14.0	90.9
McNeal	13.5	11.3	15.1	17.2	11.7	13.8	89.9
MT0832	--	--	--	--	11.0	11.0	87.3

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.

Table 6. Agronomic data obtained from a dryland recrop durum yield trial conducted at the Eastern Agricultural Research Center, Sidney, MT.

entry	heading*	height, cm	height, in	grain protein, %	HVAC	test wt, lb/bu	yield, bu/ac
Divide	65.0	74.7	29.4	11.61	57.9	59.5	48.6
Grenora	64.3	68.7	27.0	11.40	52.1	60.0	46.2
Tioga	65.3	80.3	31.6	12.24	63.1	60.0	46.0
Cimmyt#5	65.7	55.3	21.8	11.36	52.0	58.5	44.7
MT03012	61.7	59.3	23.4	12.03	74.9	59.5	44.4
Alkabo	65.0	70.7	27.8	12.38	62.9	60.5	44.3
Pierce	64.7	78.7	31.0	12.29	74.8	61.0	44.0
Mountrail	65.3	65.0	25.6	10.89	51.0	60.5	43.9
MT01649	62.3	52.3	20.6	11.84	61.3	58.5	43.1
Cimmyt#11	64.3	61.7	24.3	11.54	53.1	59.0	43.0
Normanno	63.7	59.0	23.2	11.00	65.2	59.5	42.8
Strongfield	65.3	72.0	28.3	12.67	74.2	59.0	42.7
Cimmyt#8	65.7	66.0	26.0	12.30	69.1	59.5	42.5
Alzada	63.0	64.0	25.2	11.30	71.1	60.5	41.7
MT04174	61.3	65.3	25.7	11.45	64.6	60.5	40.9
MT04340	63.7	59.3	23.4	13.11	81.9	58.0	38.6
mean	64.2	65.8	25.9	11.84	64.3	59.6	43.6
probability	<0.001	<0.001					0.430
CV (S/mean)	1.0	5.9					8.9
CV (SE/mean)	0.6	3.4					5.2
LSD 0.05	1.1	6.4					6.5

* days from planting

Table 7. Relative yields of durum varieties in bu/ac as compared to Mountrail when grown under dryland continuous cropping at the EARC, Sidney, Montana.

Cultivar	2006	2007	2008	2009	2010	Ave	as % of Mountrail
Tioga	--	--	--	--	46.0	46.0	105.3
Alkabo	33.4	48.5	8.5	31.5	44.3	33.2	101.3
Divide	31.9	38.8	7.3	37.9	48.6	32.9	100.3
Mountrail	32.0	43.6	6.5	38.2	43.7	32.8	100.0
MT03012	31.4	36.4	6.9	38.8	44.4	31.6	96.3
Cimmyt#5	--	--	7.8	31.0	44.7	27.8	94.5
Cimmyt#11	--	--	5.4	35.0	43.0	27.8	94.4
Alzada	32.4	39.9	7.9	29.6	41.7	30.3	92.4
Grenora	30.6	41.4	5.8	24.9	46.2	29.8	90.8
Normanno	--	--	--	31.1	42.8	37.0	90.2
MT04174	--	--	5.7	31.2	41.9	26.3	89.2
Cimmyt#8	--	--	8.0	28.0	42.5	26.2	88.8
MT04340	--	--	--	--	38.6	38.6	88.3
Strongfield	29.3	28.7	6.6	36.5	42.7	28.8	87.7
Pierce	29.1	40.2	6.5	20.6	44.0	28.1	85.6
MT01649	--	--	--	26.2	43.1	34.7	84.6

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 in lb/bu as compared to Mountrail when grown under dryland continuous cropping at the EARC, Sidney, Montana.

Cultivar	2006	2007	2008	2009	2010	Ave	as % of Mountrail
Alkabo	59.2	63.2	58.7	61.0	60.5	60.5	102.3
Pierce	59.0	62.2	57.5	60.3	61.0	60.0	101.4
MT04174	--	--	56.2	61.3	60.5	59.3	101.1
Divide	58.7	62.2	56.5	61.5	59.5	59.7	100.8
MT03012	58.0	63.0	55.7	61.2	59.5	59.5	100.5
Alzada	58.3	61.2	56.7	60.3	60.5	59.4	100.4
Strongfield	58.8	62.2	56.2	60.7	59.0	59.4	100.3
Grenora	57.0	62.8	56.0	60.5	60.0	59.3	100.1
Mountrail	57.8	62.0	54.8	60.8	60.5	59.2	100.0
Cimmyt#8	--	--	55.2	60.5	59.5	58.4	99.5
Tioga	--	--	--	--	60.0	60.0	99.2
Cimmyt#5	--	--	54.7	60.8	58.5	58.0	98.8
Normanno	--	--	--	60.2	59.5	59.9	98.7
MT01649	--	--	--	60.3	58.5	59.4	97.9
Cimmyt#11	--	--	51.5	60.3	59.0	56.9	97.0
MT04340	--	--	--	--	58.0	58.0	95.9

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 9. Relative heights of durum varieties in inches as compared to Mountrail when grown under dryland continuous cropping at the EARC, Sidney, Montana.

Cultivar	2006	2007	2008	2009	2010	Ave	as % of Mountrail
Tioga	--	--	--	--	32	32.0	123.1
Pierce	29	35	18	20	31	26.6	109.0
Divide	28	32	20	21	29	26.0	106.6
Alkabo	28	32	19	19	28	25.2	103.3
Strongfield	28	29	19	19	28	24.6	100.8
Mountrail	29	31	17	19	26	24.4	100.0
Cimmyt#8	--	--	18	17	26	20.3	98.4
MT04174	--	--	18	17	26	20.3	98.4
Cimmyt#11	--	--	17	19	24	20.0	96.8
Alzada	26	29	20	18	25	23.6	96.7
Grenora	26	29	18	18	27	23.6	96.7
MT04340	--	--	--	--	23	23.0	88.5
MT03012	24	26	16	18	23	21.4	87.7
Normanno	--	--	--	16	23	19.5	86.7
Cimmyt#5	--	--	16	15	22	17.7	85.5
MT01649	--	--	--	15	21	18.0	80.0

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

Table 10. Relative protein contents of durum varieties in percent as compared to Mountrail when grown under dryland continuous cropping at the EARC, Sidney, Montana.

Cultivar	2006	2007	2008	2009	2010	Ave	as % of Mountrail
MT04340	--	--	--	--	13.1	13.1	120.2
Tioga	--	--	--	--	12.2	12.2	111.9
MT01649	--	--	--	15.2	11.8	13.5	104.7
Pierce	14.5	14.2	14.8	16.6	12.3	14.5	103.3
MT04174	--	--	15.8	15.0	11.4	14.1	101.7
Strongfield	14.2	12.6	15.5	15.7	12.7	14.1	100.9
Mountrail	15.0	13.6	15.7	14.9	10.9	14.0	100.0
Normanno	--	--	--	14.7	11.0	12.9	99.6
Grenora	14.6	13.5	14.9	15.4	11.4	14.0	99.6
MT03012	15.2	13.4	15.1	13.6	12.0	13.9	98.9
Alkabo	14.1	13.9	13.8	14.8	12.4	13.8	98.4
Cimmyt#8	--	--	14.5	14.0	12.3	13.6	98.3
Divide	14.0	14.2	14.5	14.5	11.6	13.8	98.1
Alzada	13.8	13.6	14.8	15.3	11.3	13.8	98.1
Cimmyt#5	--	--	14.4	13.9	11.4	13.2	95.7
Cimmyt#11	--	--	15.9	12.2	11.5	13.2	95.4

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.

Table 11. Relative NIR hardness of durum varieties in percent as compared to Mountrail when grown under dryland continuous cropping at the EARC, Sidney, Montana.

Cultivar	2006	2007	2008	2009	2010	Ave	as % of Mountrail
MT04340	--	--	--	--	81.9	81.9	160.6
Tioga	--	--	--	--	63.1	63.1	123.7
MT03012	84.7	87.6	71.0	102.0	74.9	84.0	112.0
MT04174	--	--	75.4	104.4	64.6	81.5	110.8
Pierce	78.5	85.3	74.0	102.9	74.8	83.1	110.7
Alzada	75.1	85.7	72.4	98.6	71.1	80.6	107.4
MT01649	--	--	--	103.6	61.3	82.5	106.9
Strongfield	80.1	69.1	69.5	105.3	74.2	79.6	106.1
Alkabo	74.9	84.9	66.4	103.9	64.9	79.0	105.2
Grenora	76.2	82.8	72.1	103.6	52.1	77.4	103.1
Normanno	--	--	--	93.6	65.2	79.4	102.9
Divide	66.1	84.5	66.9	105.3	57.9	76.1	101.4
Mountrail	76.4	78.3	66.3	103.3	51.0	75.1	100.0
Cimmyt#8	--	--	50.5	90.2	69.1	69.9	95.1
Cimmyt#5	--	--	58.7	93.9	52.0	68.2	92.7
Cimmyt#11	--	--	49.6	89.4	53.1	64.0	87.1

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.

Table 12. Agronomic data obtained from a dryland recrop barley yield trial conducted at the Eastern Agricultural Research Center, Sidney, MT.

entry	heading*	height, cm	height, in	test wt, lb/bu	grain protein, %	% plump	% regular	yield, bu/ac	
MT020155	63.3	62.7	24.7	50.5	9.39	94	6	65.7	a
Goldeneye	65.0	59.7	23.5	50.0	10.92	88	11	62.0	
Hockett	64.3	63.3	24.9	50.5	9.38	95	4	60.9	
MT010160	66.7	60.3	23.8	50.0	8.26	89	10	60.7	
MT050030	67.3	51.7	20.3	52.0	9.64	97	3	58.3	
Conrad	66.3	55.0	21.7	50.5	10.67	96	3	55.4	
Geraldine	67.3	53.7	21.1	50.0	9.73	84	15	54.9	
MT030042	65.7	57.7	22.7	52.0	8.31	92	8	54.6	
Gallatin	65.0	66.7	26.2	51.0	8.84	93	7	54.6	
Harrington	65.7	53.7	21.1	49.5	8.97	94	6	54.0	
BZ596117	66.0	53.3	21.0	52.5	10.02	95	5	53.9	
Champion	66.7	58.3	23.0	52.0	9.76	96	4	53.7	
Metcalfe	64.3	61.3	24.1	49.5	9.46	90	9	53.1	
Haxby	65.7	55.7	21.9	54.0	8.34	95	5	51.0	
MT010158	65.3	54.7	21.5	52.0	8.26	97	3	47.8	
Pinnacle	65.0	48.7	19.2	51.0	8.14	99	1	46.5	
mean	65.6	57.3	22.5	51.1	9.25	93	6	55.4	
probability	<0.001	0.002						0.141	
CV (S/mean)	1.0	7.9						12.7	
CV (SE/mean)	0.4	2.6						4.1	
LSD 0.05	0.6	4.6						7.3	

a indicates significantly greater yield than check variety, Haxby, at probability = 0.05

Table 13. Relative yields of barley varieties in bu/ac compared to Haxby when grown under dryland recrop conditions at the EARC, Sidney, Montana.

Cultivar	2005	2006	2007	2008	2010	Ave	as % of Haxby
MT020155	--	--	--	8.4	65.7	37.1	125.4
Goldeneye	--	--	--	--	62.0	62.0	121.6
MT010160	--	--	--	--	60.7	60.7	119.0
MT050030	--	--	--	--	58.3	58.3	114.3
Champion	--	--	--	9.8	53.7	31.8	107.4
MT030042	--	--	--	--	54.6	54.6	107.1
Gallatin	--	--	--	--	54.6	54.6	107.1
BZ596117	--	--	--	--	53.9	53.9	105.7
Haxby	52.6	59.1	40.8	8.1	51.0	42.3	100.0
Metcalfe	53.4	54.0	39.9	6.4	53.1	41.4	97.7
Hockett	48.1	53.0	33.5	10.7	60.9	41.2	97.4
Conrad	47.0	47.6	41.4	8.9	55.4	40.1	94.7
MT010158	--	--	--	7.8	47.8	27.8	94.1
Harrington	46.8	51.4	36.5	7.4	54.0	39.2	92.7
Pinnacle	--	--	--	--	46.5	46.5	91.2
Geraldine	44.1	44.9	33.7	7.6	54.9	37.0	87.5

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. No trial in 2009.

Table 14. Relative test weights of barley varieties in lb/bu compared to Haxby when grown under dryland recrop conditions at the EARC, Sidney, Montana.

Cultivar	2005	2006	2007	2008	2010	Ave	as % of Haxby
Haxby	48.8	49.3	51.8	50.5	54.0	50.9	100.0
BZ596117	--	--	--	--	52.5	52.5	97.2
MT050030	--	--	--	--	52.0	52.0	96.3
MT030042	--	--	--	--	52.0	52.0	96.3
Geraldine	50.2	46.2	50.5	47.0	50.0	48.8	95.9
Hockett	48.2	46.3	51.3	46.0	50.5	48.5	95.2
Champion	--	--	--	47.5	52.0	49.8	95.2
Conrad	49.0	45.0	49.7	47.5	50.5	48.3	95.0
MT010158	--	--	--	47.0	52.0	49.5	94.7
Gallatin	--	--	--	--	51.0	51.0	94.4
Pinnacle	--	--	--	--	51.0	51.0	94.4
Metcalfe	49.3	44.7	50.8	45.0	49.5	47.9	94.1
Goldeneye	--	--	--	--	50.0	50.0	92.6
MT010160	--	--	--	--	50.0	50.0	92.6
MT020155	--	--	--	46.0	50.5	48.3	92.3
Harrington	47.2	44.0	50.0	43.5	49.5	46.8	92.1

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. No trial in 2009.

Table 15. Relative heights of barley varieties in inches compared to Haxby when grown under dryland recrop conditions at the EARC, Sidney, Montana.

Cultivar	2005	2006	2007	2008	2010	Ave	as % of Haxby
Gallatin	--	--	--	--	26	26.0	118.2
MT020155	--	--	--	18	25	21.5	110.3
Goldeneye	--	--	--	--	24	24.0	109.1
MT010160	--	--	--	--	24	24.0	109.1
MT030042	--	--	--	--	23	23.0	104.5
Metcalfe	29	26	22	18	24	23.8	103.5
Champion	--	--	--	17	23	20.0	102.6
Haxby	28	26	22	17	22	23.0	100.0
MT010158	--	--	--	16	22	19.0	97.4
Hockett	25	24	20	17	25	22.2	96.5
BZ596117	--	--	--	--	21	21.0	95.5
Harrington	25	25	22	16	21	21.8	94.8
Conrad	25	24	20	16	22	21.4	93.0
MT050030	--	--	--	--	20	20.0	90.9
Geraldine	24	23	18	15	21	20.2	87.8
Pinnacle	--	--	--	--	19	19.0	86.4

NOTE: Average heights in this summary should not be compared to each other since they are not grown in the same years. Compare heights only to the check variety. No trial in 2009.

Table 16. Relative protein contents as percent of barley varieties compared to Haxby when grown under dryland recrop conditions at the EARC, Sidney, Montana.

Cultivar	2005	2006	2007	2008	2010	Ave	as % of Haxby
Goldeneye	--	--	--	--	10.9	10.9	131.3
BZ596117	--	--	--	--	10	10.0	120.5
MT050030	--	--	--	--	9.6	9.6	115.7
Gallatin	--	--	--	--	8.8	8.8	106.0
Geraldine	11.1	11.4	10.4	13.0	9.7	11.1	102.6
Metcalfe	11.2	12.3	8.9	12.7	9.5	10.9	100.7
Conrad	9.9	11.9	10.9	10.9	10.7	10.9	100.2
Haxby	10.8	10.7	10.9	13.5	8.3	10.8	100.0
MT010160	--	--	--	--	8.3	8.3	100.0
MT030042	--	--	--	--	8.3	8.3	100.0
Hockett	11.4	10.7	9.3	12.3	9.4	10.6	98.0
Pinnacle	--	--	--	--	8.1	8.1	97.6
Harrington	10.2	10.9	9.9	12.3	9.0	10.5	96.5
MT020155	--	--	--	11.5	9.4	10.5	95.9
Champion	--	--	--	10.9	9.8	10.4	95.0
MT010158	--	--	--	11.5	8.3	9.9	90.8

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. No trial in 2009.