

PROJECT TITLE: Evaluation of spring wheat varieties under dryland fallow and dryland recrop conditions at four off-station sites -- 2013 (4W4145)

PRINCIPAL INVESTIGATOR: Joyce Eckhoff, Eastern Agricultural Research Center, Sidney
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Personnel:

Site/County	Producer	CES Agent
Flaxville, Daniels	David Roos	Bobbie Roos
Poplar, Roosevelt	Mark Swank	Ann Ronning
Nashua, Valley	Bill Lauckner	Shelley Mills
Wibaux, Wibaux	David Maus	Dave Bertelsen

The Wibaux site was not harvested because of poor stands.

OBJECTIVE: To evaluate varieties of spring wheat under dryland conditions at various sites in eastern Montana.

METHODS:

County	previous crop	planting date	harvest date
Valley, dryland	fallow	May 23	September 5
Roosevelt, dryland	fallow	May 22	September 17
Wibaux, dryland	spring wheat	June 7	not harvested
Daniels, dryland	spring wheat	May 22	September 17

RESULTS: The Wibaux site was not harvested because of poor stand. Summaries of yields, test weights, protein contents, and heights in inches across all sites are shown in Tables 1-4. MT1172 yielded most across sites (Table 1). Velva had greatest test weight across sites (Table 2). Kelby had the highest protein content across sites (Table 3). Mott was tallest across sites and Jedd was shortest across sites (Table 4).

Flaxville, Daniels County: Performances of spring wheat varieties grown at Flaxville are shown in Table 5. This was the first year at this site, so there are no relative tables across years. Velva had greatest economic return.

Nashua, Valley County: Performances and relative values of yield, test weight and protein of spring wheat varieties at Nashua are shown in Tables 7-9. MT1172 had greatest economic return.

Poplar, Roosevelt County: Performance and relative values of yield, test weight and protein of spring wheat varieties at Poplar are shown in Tables 10-13. MT1172 had greatest economic return.

SUMMARY: Off-station yield trials are conducted at several sites in 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 State University, other state universities, and private companies.

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

MWBC FY2014 GRANT SUBMISSION PLANS: It is planned to submit this project for funding consideration in the next fiscal year.

Table 1. Summary of spring wheat yields in bu/acre at three off-station sites in eastern Montana, 2013.

Variety	Flaxville, dryland recrop	Nashua, dryland fallow	Poplar, dryland fallow	average
McNeal	21.9	35.6	76.4	44.6
Reeder	24.6	42.0	78.3	48.3
Choteau	19.3	39.6	71.9	43.6
Vida	21.3	48.7	76.0	48.7
Duclair	19.7	33.2	67.8	40.2
Elgin	21.0	49.5	74.6	48.4
Volt	18.0	48.2	64.9	43.7
Jedd	17.7	39.9	71.2	42.9
Oneal	20.2	43.7	67.7	43.9
WB9879CLP	18.9	45.9	68.2	44.3
Kelby	21.2	43.4	74.0	46.2
AP604CL	23.3	38.5	68.7	43.5
Mott	23.8	49.3	71.6	48.2
WB Gunnison	18.8	41.6	58.9	39.8
SY Tyra	23.1	42.9	76.2	47.4
Velva	27.7	46.7	82.3	52.2
Prosper	19.9	43.4	76.7	46.7
MT1053	20.9	60.4	69.4	50.2
MT1142	20.9	46.8	77.9	48.5
MT1172	24.0	54.6	78.3	52.3
site average	21.3	44.7	72.6	46.2
probability	0.001	0.0003	<0.001	
CV (S/Mean)	11.3	12.76	3.9	
CV(SE/Mean)	6.5	7.368	2.3	
LSD 0.05	4.0	9.429	4.7	

Table 2. Summary of spring wheat test weights in lb/bu at three off-station sites in eastern Montana, 2013.

Variety	Flaxville, dryland recrop	Nashua, dryland fallow	Poplar, dryland fallow	average
McNeal	58.5	61.0	60.5	60.0
Reeder	60.5	60.0	61.0	60.5
Choteau	58.5	59.0	60.0	59.2
Vida	59.0	59.5	60.0	59.5
Duclair	57.5	58.0	59.5	58.3
Elgin	60.0	60.5	62.0	60.8
Volt	59.5	62.5	62.5	61.5
Jedd	59.5	61.0	60.5	60.3
Oneal	59.5	62.0	60.0	60.5
WB9879CLP	58.0	60.0	59.5	59.2
Kelby	59.5	61.5	60.5	60.5
AP604CL	60.0	61.0	61.5	60.8
Mott	60.0	61.5	61.5	61.0
WB Gunnison	59.0	62.5	61.0	60.8
SY Tyra	60.5	62.5	60.5	61.2
Velva	61.0	62.0	62.0	61.7
Prosper	59.0	61.0	61.5	60.5
MT1053	57.5	61.5	60.5	59.8
MT1142	58.0	61.0	61.0	60.0
MT1172	57.5	60.5	59.0	59.0
site average	59.1	60.9	60.7	60.2

Table 3. Summary of spring wheat protein contents in percent at three dryland off-station sites in eastern Montana, 2013.

Variety	Flaxville, dryland recrop	Nashua, dryland fallow	Poplar, dryland fallow	average
McNeal	10.87	13.60	15.27	13.25
Reeder	10.72	13.96	14.63	13.11
Choteau	10.86	14.45	14.77	13.36
Vida	10.73	13.84	14.37	12.98
Duclair	10.81	14.70	14.22	13.24
Elgin	10.14	14.78	14.97	13.30
Volt	11.02	14.65	14.03	13.24
Jedd	10.76	13.83	14.02	12.87
Oneal	10.12	15.56	14.65	13.45
WB9879CLP	10.84	15.12	14.72	13.56
Kelby	13.20	13.95	15.45	14.20
AP604CL	11.59	14.04	15.25	13.63
Mott	11.94	14.10	14.77	13.60
WB Gunnison	11.88	13.40	13.62	12.97
SY Tyra	10.86	12.44	13.00	12.10
Velva	10.94	13.06	14.42	12.81
Prosper	11.40	13.19	13.42	12.67
MT1053	11.47	13.10	13.83	12.80
MT1142	11.97	14.35	15.32	13.88
MT1172	11.33	14.68	15.40	13.80
site average	11.17	14.04	14.51	13.24

Table 4. Summary of spring wheat heights in inches at three dryland off-station sites in eastern Montana, 2013.

Variety	Flaxville, dryland recrop	Nashua, dryland fallow	Poplar, dryland fallow	average
McNeal	24.4	28.1	33.1	28.5
Reeder	23.5	26.8	33.9	28.1
Choteau	23.0	25.9	31.4	26.7
Vida	22.8	27.9	33.2	28.0
Duclair	22.3	26.7	30.6	26.5
Elgin	23.6	29.0	36.3	29.7
Volt	22.7	26.4	32.8	27.3
Jedd	19.6	22.1	26.1	22.6
Oneal	23.5	27.8	32.6	27.9
WB9879CLP	21.6	24.8	32.2	26.2
Kelby	20.8	25.6	29.1	25.2
AP604CL	23.6	27.8	33.3	28.3
Mott	26.4	29.7	36.7	30.9
WB Gunnison	22.8	26.4	31.6	26.9
SY Tyra	21.7	24.4	29.9	25.3
Velva	23.6	29.1	35.0	29.3
Prosper	24.4	29.1	33.9	29.1
MT1053	23.6	26.4	32.6	27.5
MT1142	22.0	28.5	33.6	28.0
MT1172	23.6	26.9	31.9	27.5
site average	23.0	26.97	32.5	27.5
probability	<0.001	0.0001	<0.001	
CV (S/Mean)	4.2	5.913	5.1	
CV(SE/Mean)	2.4	3.414	2.9	
LSD 0.05	1.6	2.636	2.7	

Table 5. Performance of spring wheat grown under dryland recrop conditions at Flaxville, MT. Previous crop was spring wheat.

Planted: May 22, 2013 Harvested: September 17, 2013 Cooperator: Dave Roos

Variety	height, in	test wt, lb/bu	grain protein, %	yield, bu/ac	\$/acre ¹ +/- Vida
Velva	23.6	61.0	10.94	27.7	37.69
Reeder	23.5	60.5	10.72	24.6	19.43
MT1172	23.6	57.5	11.33	24.0	15.90
Mott	26.4	60.0	11.94	23.8	14.72
AP604CL	23.6	60.0	11.59	23.3	11.78
SY Tyra	21.7	60.5	10.86	23.1	10.60
McNeal	24.4	58.5	10.87	21.9	3.52
Vida	22.8	59.0	10.73	21.3	0.00
Kelby	20.8	59.5	13.20	21.2	-0.59
Elgin	23.6	60.0	10.14	21.0	-1.77
MT1053	23.6	57.5	11.47	20.9	-2.36
MT1142	22.0	58.0	11.97	20.9	-2.36
Oneal	23.5	59.5	10.12	20.2	-6.48
Prosper	24.4	59.0	11.40	19.9	-8.25
Duclair	22.3	57.5	10.81	19.7	-9.43
Choteau	23.0	58.5	10.86	19.3	-11.78
WB9879CLP	21.6	58.0	10.84	18.9	-14.14
WB Gunnison	22.8	59.0	11.88	18.8	-14.73
average	22.7	59.5	11.02	18.0	
probability	19.6	59.5	10.76	17.7	
CV (S/Mean)	23.0	59.1	11.2	21.3	
CV(SE/Mean)	<0.001			0.001	
LSD 0.05	4.2			11.3	

¹ Wheat prices compiled and summarized by P. Lamb, NARC, Havre, MT, from 3-yr (2010-2012) average daily market values for PNW, supplied by the Montana Wheat and Barley Committee.

Table 6. Performance of spring wheat grown under dryland fallow conditions at Nashua, MT. Planted: May 23, 2013 Harvested: September 5, 2013 Cooperator: Bill Lauckner

Variety	height, in	test wt, lb/bu	grain protein, %	yield, bu/ac	\$/acre ¹ +/- Vida
MT1172	26.9	60.5	14.68	54.6	99.32
MT1053	26.4	61.5	13.10	60.4	60.70
Elgin	29.0	60.5	14.78	49.5	48.83
Volt	26.4	62.5	14.65	48.2	35.96
WB9879CLP	24.8	60.0	15.12	45.9	21.91
Mott	29.7	61.5	14.10	49.3	17.76
Oneal	27.8	62.0	15.56	43.7	17.19
MT1142	28.5	61.0	14.35	46.8	3.38
Vida	27.9	59.5	13.84	48.7	0.0
Kelby	25.6	61.5	13.95	43.4	-37.17
Reeder	26.8	60.0	13.96	42.0	-50.20
Velva	29.1	62.0	13.06	46.7	-53.14
Choteau	25.9	59.0	14.45	39.6	-57.10
Prosper	29.1	61.0	13.19	43.4	-69.72
WB Gunnison	26.4	62.5	13.40	41.6	-74.72
Jedd	22.1	61.0	13.83	39.9	-79.73
AP604CL	27.8	61.0	14.04	38.5	-82.78
SY Tyra	24.4	62.5	12.44	42.9	-84.72
average	28.1	61.0	13.60	35.6	
probability	26.7	58.0	14.70	33.2	
CV (S/Mean)	26.97	60.9	14.04	44.7	
CV(SE/Mean)	0.0001			0.0003	
LSD 0.05	5.913			12.76	

¹ Wheat prices compiled and summarized by P. Lamb, NARC, Havre, MT, from 2-yr (2010-2011) average daily market values for PNW, supplied by the Montana Wheat and Barley Committee.

Table 7. Relative yielding abilities of spring wheat varieties as compared to Vida when grown under dryland conditions in Valley County in cooperation with CES.

Cultivar	2009	2010	2011	2012	2013	average	as % of Vida
MT1053	--	--	--	26.4	60.4	43.4	117.0
MT1172	--	--	--	--	54.6	54.6	112.1
Kelby	29.5	44.9	46.0	29.6	43.4	38.7	102.4
Elgin	--	--	--	--	49.5	49.5	101.6
Vida	25.0	40.8	48.8	25.5	48.7	37.8	100.0
Volt	30.8	35.1	46.2	23.9	48.2	36.8	97.6
AP604CL	30.9	44.4	43.5	25.6	38.5	36.6	96.9
MT1142	--	--	--	--	46.8	46.8	96.1
Velva	--	--	--	--	46.7	46.7	95.9
Reeder	30.4	38.6	45.1	23.7	42.0	36.0	95.2
WB9879CLP	--	--	--	--	45.9	45.9	94.3
ONeal	29.8	31.2	47.0	25.2	43.7	35.4	93.7
SY Tyra	--	--	45.2	24.1	42.9	37.4	91.2
Prosper	--	--	39.3	29.5	43.4	37.4	91.2
Jedd	29.3	29.0	43.5	27.6	39.9	33.9	89.7
McNeal	26.9	38.8	44.4	20.5	35.6	33.2	88.0
WB Gunnison	--	--	36.8	25.6	41.6	34.7	84.6
Mott	26.2	18.0	41.9	23.4	49.3	31.8	84.1
Choteau	22.2	28.4	40.4	20.9	39.6	30.3	80.2
Duclair	--	25.8	35.9	20.8	33.2	28.9	70.6

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 spring wheat varieties as compared to Vida when grown under dryland conditions in Valley County in cooperation with CES.

Cultivar	2009	2010	2011	2012	2013	average	as % of Vida
Velva	--	--	--	--	62.0	62.0	104.2
SY Tyra	--	--	61.5	60.0	62.5	61.3	104.0
WB Gunnison	--	--	60.5	59.5	62.5	60.8	103.1
Volt	60.3	58.0	62.0	57.0	62.5	60.0	102.7
MT1142	--	--	--	--	61.0	61.0	102.5
Jedd	60.8	57.0	61.0	59.0	61.0	59.8	102.3
Kelby	59.3	58.0	60.5	59.5	61.5	59.8	102.3
ONeal	61.2	56.5	60.0	59.0	62.0	59.7	102.3
MT1053	--	--	--	58.0	61.5	59.8	102.1
AP604CL	59.5	58.0	60.5	59.0	61.0	59.6	102.1
MT1172	--	--	--	--	60.5	60.5	101.7
Elgin	--	--	--	--	60.5	60.5	101.7
Mott	58.8	56.5	60.5	58.0	61.5	59.1	101.1
WB9879CLP	--	--	--	--	60.0	60.0	100.8
Reeder	59.8	56.5	60.0	57.5	60.0	58.8	100.6
Prosper	--	--	60.0	57.0	61.0	59.3	100.6
McNeal	59.3	56.5	59.5	56.5	61.0	58.6	100.3
Vida	59.0	56.0	60.0	57.5	59.5	58.4	100.0
Choteau	58.2	55.5	59.5	56.5	59.0	57.7	98.9
Duclair	--	54.0	59.5	57.0	58.0	57.1	98.1

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 9. Relative protein contents of spring wheat varieties as compared to Vida when grown under dryland conditions in Valley County in cooperation with CES.

Cultivar	2009	2010	2011	2012	2013	average	as % of Vida
WB9879CLP	--	--	--	--	15.1	15.1	109.4
Elgin	--	--	--	--	14.8	14.8	107.2
MT1172	--	--	--	--	14.7	14.7	106.5
MT1142	--	--	--	--	14.4	14.4	104.3
Reeder	16.2	15.8	16.2	15.6	14.0	15.6	103.3
Choteau	16.1	14.9	14.5	16.7	14.4	15.3	101.7
ONeal	15.8	15.2	14.6	15.2	15.6	15.3	101.5
Kelby	15.5	15.2	15.0	15.9	14.0	15.1	100.4
Vida	16.9	14.7	15.3	14.6	13.8	15.1	100.0
Duclair	--	14.8	13.9	14.7	14.7	14.5	99.5
Mott	15.5	15.2	14.8	15.3	14.1	15.0	99.5
McNeal	15.4	14.7	14.2	16.3	13.6	14.8	98.5
AP604CL	15.1	14.8	14.8	15.2	14.0	14.8	98.1
Volt	14.2	14.5	14.0	15.5	14.6	14.6	96.7
Jedd	15.2	14.4	14.2	14.5	13.8	14.4	95.8
Prosper	--	--	14.1	14.3	13.2	13.9	95.2
MT1053	--	--	--	13.9	13.1	13.5	95.1
Velva	--	--	--	--	13.1	13.1	94.9
WB Gunnison	--	--	13.7	14.1	13.4	13.7	94.3
SY Tyra	--	--	14.0	14.1	12.4	13.5	92.7

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

Table 10. Performance of spring wheat grown under dryland conditions at Poplar, MT.
 Planted: May 22, 2013 Harvested: Sept 17, 2013 Cooperator: Mark Swank

Variety	height, in	lodging index	test wt, lb/bu	percent protein	yield, bu/acre	\$/acre ¹ +/- Vida
MT 1172	31.9	3.0	59.0	15.40	78.3	99.37
MT 1142	33.6	2.7	61.0	15.32	77.9	79.59
Velva	35.0	1.3	62.0	14.42	82.3	76.31
McNeal	33.1	1.7	60.5	15.27	76.4	64.16
Kelby	29.1	0.7	60.5	15.45	74.0	54.26
Reeder	33.9	1.0	61.0	14.63	78.3	37.51
Elgin	36.3	1.0	62.0	14.97	74.6	30.71
Vida	33.2	2.3	60.0	14.37	76.0	0.0
Choteau	31.4	3.0	60.0	14.77	71.9	-10.19
Mott	36.7	2.7	61.5	14.77	71.6	-13.16
AP604CL	33.3	5.0	61.5	15.25	68.7	-15.08
Prosper	33.9	1.7	61.5	13.42	76.7	-46.27
WB9879CLP	32.2	3.2	59.5	14.72	68.2	-46.82
Oneal	32.6	1.3	60.0	14.65	67.7	-51.77
Jedd	26.1	0.3	60.5	14.02	71.2	-59.13
Duclair	30.6	3.5	59.5	14.22	67.8	-77.90
SY Tyra	29.9	2.7	60.5	13.00	76.2	-88.78
MT 1053	32.6	2.7	60.5	13.83	69.4	-93.24
Volt	32.8	0.7	62.5	14.03	64.9	-117.78
WB Gunnison	31.6	3.5	61.0	13.62	58.9	-203.09
average	32.5	2.2	60.7	14.50	72.6	
probability	<0.001	<0.001			<0.001	
CV (S/MEAN)	5.1	37.2			3.9	
CV (SE/MEAN)	2.9	21.5			2.3	
LSD (0.05)	2.7	1.3			4.7	

¹ Wheat prices compiled and summarized by P. Lamb, NARC, Havre, MT, from 3-yr (2010-2012) average daily market values for PNW, supplied by the Montana Wheat and Barley Committee.

Table 11. Relative yields of spring wheat varieties as compared to Vida when grown under dryland conditions in Roosevelt County in cooperation with CES.

Cultivar	2009	2010	2011	2012	2013	average	as % of Vida
Velva	--	--	--	--	82.3	82.3	108.3
MT1172	--	--	--	--	78.3	78.3	103.0
MT1142	--	--	--	--	77.9	77.9	102.5
Vida	59.7	47.7	63.8	49.0	76.0	59.2	100.0
Kelby	55.1	54.0	64.6	44.1	74.0	58.4	98.5
Elgin	--	--	--	--	74.6	74.6	98.2
SY Tyra	--	--	62.4	45.7	76.2	61.4	97.6
AP604CL	58.6	52.1	57.3	50.1	68.7	57.4	96.8
Reeder	59.3	47.5	54.5	47.0	78.3	57.3	96.8
Duclair	--	52.2	61.4	46.8	67.8	57.1	96.5
Prosper	--	--	56.5	46.9	76.7	60.0	95.4
Choteau	58.0	47.6	58.4	44.2	71.9	56.0	94.6
Mott	59.5	37.4	64.0	47.2	71.6	55.9	94.4
Jedd	48.1	52.5	58.5	45.5	71.2	55.2	93.1
MT1053	--	--	--	45.0	69.4	57.2	91.5
McNeal	50.7	38.8	58.7	43.8	76.4	53.7	90.6
ONeal	58.0	43.9	57.9	40.0	67.7	53.5	90.3
WB9879CLP	--	--	--	--	68.2	68.2	89.7
Volt	55.8	34.6	59.5	41.3	64.9	51.2	86.5
WB Gunnison	--	--	54.5	44.2	58.9	52.5	83.5

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.

Table 12. Relative test weights of spring wheat varieties as compared to Vida when grown under dryland conditions in Roosevelt County in cooperation with CES.

Cultivar	2009	2010	2011	2012	2013	average	as % of Vida
Velva	--	--	--	--	62.0	62.0	103.3
Elgin	--	--	--	--	62.0	62.0	103.3
Volt	63.0	58.5	62.0	59.0	62.5	61.0	103.2
AP604CL	62.7	59.5	62.0	58.5	61.5	60.8	102.9
Kelby	62.5	58.0	61.5	59.0	60.5	60.3	102.0
Reeder	62.2	58.0	61.5	58.0	61.0	60.1	101.8
MT1142	--	--	--	--	61.0	61.0	101.7
WB Gunnison	--	--	61.5	57.0	61.0	59.8	101.4
SY Tyra	--	--	61.0	57.0	60.5	59.5	100.8
Jedd	62.0	57.5	61.0	57.0	60.5	59.6	100.8
Mott	61.5	56.5	61.5	57.0	61.5	59.6	100.8
Prosper	--	--	60.0	56.0	61.5	59.2	100.3
Vida	61.0	57.5	61.0	56.0	60.0	59.1	100.0
ONeal	62.7	57.0	60.0	55.5	60.0	59.0	99.9
WB9879CLP	--	--	--	--	59.5	59.5	99.2
McNeal	61.0	56.0	60.0	55.5	60.5	58.6	99.2
MT1053	--	--	--	54.5	60.5	57.5	99.1
Choteau	61.7	55.5	59.5	56.0	60.0	58.5	99.1
MT1172	--	--	--	--	59.0	59.0	98.3
Duclair	--	55.0	59.0	56.0	59.5	57.4	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 13. Relative protein contents of spring wheat varieties as compared to Vida when grown under dryland conditions in Roosevelt County in cooperation with CES.

Cultivar	2009	2010	2011	2012	2013	average	as % of Vida
MT1172	--	--	--	--	15.4	15.4	106.9
Kelby	13.4	16.2	15.7	16.3	15.4	15.4	106.4
MT1142	--	--	--	--	15.3	15.3	106.3
Elgin	--	--	--	--	15.0	15.0	104.2
WB9879CLP	--	--	--	--	14.7	14.7	102.1
ONeal	11.6	16.4	14.1	16.9	14.6	14.7	101.7
Reeder	12.4	15.4	15.1	15.9	14.6	14.7	101.4
MT1053	--	--	--	16.3	13.8	15.1	101.3
AP604CL	11.9	15.4	14.4	15.9	15.2	14.6	100.6
Choteau	12.2	15.3	13.9	16.5	14.8	14.5	100.4
Vida	12.4	15.6	14.7	15.3	14.4	14.5	100.0
Mott	12.0	15.6	14.0	16.0	14.8	14.5	100.0
Velva	--	--	--	--	14.4	14.4	100.0
Duclair	--	16.1	13.8	15.8	14.2	15.0	99.8
Prosper	--	--	15.0	15.5	13.4	14.6	98.9
McNeal	11.3	14.9	13.3	16.5	15.3	14.3	98.5
Jedd	11.7	14.9	13.7	16.0	14.0	14.1	97.1
WB Gunnison	--	--	14.0	15.5	13.6	14.4	97.1
Volt	11.3	16.2	13.2	15.2	14.0	14.0	96.5
SY Tyra	--	--	13.6	14.8	13.0	13.8	93.2

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.