

PROJECT TITLE: Evaluation of spring wheat varieties under minimum-till, continuous cropping conditions – 2014 (4W4640)

PRINCIPAL INVESTIGATOR:

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

Methods:

Planted: April 23 Harvested: August 14

Soil type: Williams clay loam

Previous crops: 2013- peas, 2012- spring wheat, 2011 – spring wheat

Residual soil N to 3 ft: 49 lb/bu

Residual soil P to 6 in: 41 ppm

Applied fertilizer: 25 lb N/ac as granular 34-0-0

Herbicides: Full Deck 16 oz/ac and Axial 16 oz/ac, applied Jun 10

Precipitation April – August, 2014: 10.57 in

Ave (65 yr) precipitation April – August: 9.67 in

Precipitation September 2013 – August 2014: 13.59 in

Ave (65 yr) precipitation September – August: 14.11 in

Comments:

Conditions were wet at planting. May and August had much above average rainfall.

RESULTS:

Fourteen varieties of spring wheat were planted under dryland recrop conditions. Agronomic data are shown in Table 1. Five varieties yielded significantly less than the check variety, Vida. Five-year summaries of yield, test weight, height, and grain protein are shown in Tables 2-5.

SUMMARY: All experiments reported under this project are of the replicated small plot type. These trials provide important information about performance of malt barley lines and varieties.

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

MWBC FY2015 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 spring wheat yield trial conducted under dryland recrop conditions at the Eastern Agricultural Research Center, Sidney, Montana.

entry	heading*	height, inches	grain protein, %	test wt, lb/bu	yield, bu/ac	
Brennen	59.7	23.8	12.88	61.0	41.6	
WB9879CLP	62.0	24.7	12.62	60.0	41.4	
Vida	62.0	24.7	10.72	60.0	40.9	
SY Tyra	60.7	23.0	10.81	62.0	40.7	
Velva	63.3	23.6	12.46	60.0	38.5	
Mott	63.7	27.4	13.69	60.0	37.6	
Choteau	61.3	23.9	12.72	59.0	37.3	
Reeder	62.3	24.7	12.34	61.5	36.9	
Duclair	60.7	26.0	11.11	59.0	35.6	
Elgin	60.7	26.2	12.16	59.0	34.8	x
Egan	62.7	24.5	13.65	58.0	34.4	x
McNeal	63.0	26.5	12.27	58.5	32.4	x
Prosper	64.3	26.9	11.79	59.5	32.2	x
Barlow	61.3	25.5	13.42	62.5	27.9	x
average	62.0	25.1	12.34	59.9	37.4	
probability	<0.001	0.008			<0.001	
CV (S/mean)	1.601	5.367			8.415	
LSD 0.05	1.661	2.3			5.265	

*days from planting

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

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	2009	2010	2011	2012	2014	Ave	as % of Vida
Brennen	--	--	--	--	41.6	41.6	101.7
WB9879CLP	--	--	--	--	41.4	41.4	101.2
Vida	29.8	53.8	43.1	8.4	40.9	35.2	100.0
Velva	--	--	--	--	38.5	38.5	94.1
SY Tyra	--	--	36.0	8.1	40.7	28.3	91.8
Reeder	21.9	46.9	38.6	13.6	36.9	31.6	89.7
Duclair	--	49.4	34.6	10.4	35.6	32.5	88.9
Elgin	--	--	--	--	34.8	34.8	85.1
Egan	--	--	--	--	34.4	34.4	84.1
McNeal	24.5	40.1	40.1	9.9	32.4	29.4	83.5
Mott	16.1	46.9	36	8.9	37.6	29.1	82.7
Choteau	20.0	43.2	32.6	11.7	37.3	29.0	82.3
Prosper	--	--	33.8	7.9	32.2	24.6	80.0
Barlow	--	--	--	--	27.9	27.9	68.2

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. Hailed out in 2013.

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	2009	2010	2011	2012	2014	Ave	as % of Vida
Barlow	--	--	--	--	62.5	62.5	104.2
SY Tyra	--	--	61.4	57.5	62.0	60.3	103.0
Brennen	--	--	--	--	61.0	61.0	101.7
Reeder	61.3	61.5	60.9	55.5	61.5	60.1	101.1
Vida	61.7	60.0	61.2	54.5	60.0	59.5	100.0
Choteau	61.5	60.5	60.4	56.0	59.0	59.5	100.0
Mott	60.7	60.0	61.7	55.0	60.0	59.5	100.0
WB9879CLP	--	--	--	--	60.0	60.0	100.0
Velva	--	--	--	--	60.0	60.0	100.0
Prosper	--	--	61.9	52.5	59.5	58.0	99.0
Elgin	--	--	--	--	59.0	59.0	98.3
Duclair	--	59.5	58.6	54.0	59.0	57.8	98.0
McNeal	60.0	60.0	60.1	52.5	58.5	58.2	97.9
Egan	--	--	--	--	58.0	58.0	96.7

NOTE: Average test weights in this summary should not be compared to each other since they are not grown in the same years. Compare only to the check variety. Hailed out in 2013.

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	2009	2010	2011	2012	2014	Ave	as % of Vida
McNeal	18	29	26	22	26	24.2	105.2
Prosper	--	--	24	20	27	23.7	104.4
Elgin	--	--	--	--	26	26.0	104.0
Barlow	--	--	--	--	26	26.0	104.0
Mott	17	29	25	20	27	23.6	102.6
Duclair	--	28	24	21	26	24.8	102.1
Vida	18	29	24	19	25	23.0	100.0
WB9879CLP	--	--	--	--	25	25.0	100.0
Reeder	16	28	24	21	25	22.8	99.1
Brennen	--	--	--	--	24	24.0	96.0
Velva	--	--	--	--	24	24.0	96.0
Egan	--	--	--	--	24	24.0	96.0
Choteau	16	27	23	20	24	22.0	95.7
SY Tyra	--	--	21	20	23	21.3	94.1

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. Hailed out in 2013.

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	2009	2010	2011	2012	2014	Ave	as % of Vida
Egan	--	--	--	--	13.6	13.6	127.1
Barlow	--	--	--	--	13.4	13.4	125.2
Brennen	--	--	--	--	12.9	12.9	120.6
WB9879CLP	--	--	--	--	12.6	12.6	117.8
Velva	--	--	--	--	12.5	12.5	116.8
Elgin	--	--	--	--	12.2	12.2	114.0
Mott	18.2	12.6	16.0	16.7	13.7	15.4	108.7
Reeder	19.2	13.2	16.5	13.6	12.3	15.0	105.4
Prosper	--	--	16.0	14.0	11.8	13.9	103.0
Vida	17.8	12.6	16.2	13.7	10.7	14.2	100.0
McNeal	17.2	11.7	14.7	14.6	12.3	14.1	99.3
Choteau	17.7	11.5	14.8	13.5	12.7	14.0	98.9
SY Tyra	--	--	14.9	13.7	10.8	13.1	97.0
Duclair	--	11.0	14.7	14.2	11.1	12.8	95.9

NOTE: Average protein contents in this summary should not be compared to each other since they are not grown in the same years. Compare only to the check variety. Hailed out in 2013.