

PROJECT TITLE: Evaluation of spring wheat variety performance under no-till recrop and fallow conditions near Moccasin, Denton, Fort Benton, and Winifred.

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OBJECTIVES:
To evaluate the performance of spring wheat varieties in environments and cropping methods representative of the southern triangle and central Montana.

RESULTS:
Yield – Yields ranged from 6.1 to 36.5 bu/a with the highest yields at the Moccasin sites (Table 1). Low moisture at the Fort Benton site contributed to lower than average yields. Reeder was one of the top yielding varieties averaging 28.6 bu/a across the five locations, however differences in yield among the varieties were significant only in the Winifred and Moccasin recrop nurseries. Multiple year summaries for the locations are reported in Tables 3-6.

Heading Date – Heading dates are reported for the Moccasin nursery on fallow only (Table 1). All varieties headed within 3 days of one another and differences between the varieties were not statistically significant.

Plant Height – Plant heights averaged just over 24 inches at all locations except for the Fort Benton site (Table 1). Dry conditions contributed to plants ranging in height from 15 to 19 inches.

Test Weight – Test weights for spring wheat averaged 60 lbs/bu on Moccasin fallow and on Denton recrop (Table 2). Test weights for other locations averaged less than 60 lbs/bu.

Protein – Proteins averaged 17 percent at three locations, 15.7 percent at Denton, and 12.4 percent on Moccasin fallow. Uneven distribution of the fall application of nitrogen resulted in the low protein levels for the Moccasin fallow nursery.

SUMMARY:
Low precipitation levels resulted in lower than average yields at all locations tested. This was most evident at the Fort Benton site where yields were approximately one third that of the long term averages. Yields at the Winifred site were also significantly less than long term averages for that area.

FUTURE PLANS:
Spring wheat variety evaluations will continue at Moccasin, Denton, Fort Benton, and Winifred.

Table 1. 2001 Spring wheat heading date, yield, and plant height.
Exp. 9900 Central Agricultural Research Center, Moccasin, MT

Pedigree	Mocc	Mocc	Mocc	Denton	Ft Benton	Winifred	Average Yield	Mocc	Mocc	Denton	Ft Benton	Winifred	Average Height
	Heading Date	Fallow 9907	Recrop 9970	Recrop 9971	Recrop 9972	Fallow 9973		Fallow 9907	Recrop 9970	Recrop 9971	Recrop 9972	Fallow 9973	
	days	bu/a	bu/a	bu/a	bu/a	bu/a	bu/a	in	in	in	in	in	in
Reeder	178	34.4	35.8	32.1	10.4	30.3	28.6	24.0	27.7	26.0	17.7	24.0	23.9
Scholar	177	33.0	35.1	31.0	11.5	29.1	27.9	26.0	32.3	28.0	16.3	24.0	25.3
MT 9874	178	35.2	32.0	29.4	10.9	28.2	27.1	25.0	28.7	29.0	18.7	25.0	25.3
Amidon	176	33.1	32.3	29.5	12.0	28.3	27.1	26.7	33.7	29.0	18.0	21.7	25.8
Conan	179	34.5	33.9	28.3	9.4	28.7	26.9	26.3	27.0	26.0	17.3	25.3	24.4
Express	176	31.3	34.0	27.4	7.7	29.3	25.9	23.7	25.7	20.0	16.7	24.3	22.1
Newana	178	33.1	32.0	26.1	10.8	27.2	25.8	25.3	27.0	21.0	18.3	22.7	22.9
MTHW9710	178	33.1	34.6	28.9	7.1	25.1	25.8	26.7	26.0	24.0	15.0	24.3	23.2
McNeal	178	32.1	32.7	28.7	10.2	23.8	25.5	30.0	28.0	24.0	17.3	26.0	25.1
MTHW9904	177	34.4	30.7	28.5	9.5	23.8	25.4	26.3	30.7	29.0	15.3	24.0	25.1
MTHW9420	178	34.8	31.1	27.9	8.3	24.7	25.4	29.7	26.7	24.0	15.0	25.7	24.2
Lew	177	32.5	29.8	26.5	11.0	26.8	25.3	27.3	32.7	28.0	16.0	24.0	25.6
Westbred 936	178	33.7	27.7	30.8	7.3	26.4	25.2	27.0	24.7	20.0	17.3	23.3	22.5
Fortuna	177	36.5	29.3	26.1	10.2	23.5	25.1	24.3	32.7	26.0	16.3	25.0	24.9
Ernest	179	35.1	26.9	27.7	11.4	24.0	25.0	28.3	31.0	29.0	18.7	25.0	26.4
MT 9929	178	33.1	28.6	30.2	8.2	24.0	24.8	24.0	25.7	22.0	17.7	23.0	22.5
Rambo	178	32.0	28.3	27.1	10.5	24.7	24.5	27.7	25.3	23.0	17.3	23.7	23.4
Westbred 926	177	33.5	31.5	27.6	6.1	23.8	24.5	24.0	27.0	24.0	15.3	23.3	22.7
Hi-Line	178	30.3	29.0	26.9	10.2	26.1	24.5	30.0	28.0	22.0	16.3	24.0	24.1
Grandin	178	31.0	31.3	28.2	8.5	22.1	24.2	28.0	28.0	27.0	17.7	25.0	25.1
Average	177.5	33.3	31.3	28.4	9.6	26.0	25.7	26.5	28.4	25.1	16.9	24.2	24.2
CV (s/mean)*100	1.0	7.9	8.9	10.5	25.5	10.1		9.4	4.2		10.5	8.0	
LSD (0.05)	ns	ns	4.6	ns	ns	4.3		4.1	2.0		ns	ns	
Planting Date:		4/19/01	4/18/01	5/9/01	4/23/01	4/24/01							
Harvest Date:		8/15/01	8/15/01	8/24/01	8/16/01	8/17/01							
Fertilizer (lbs N/a):		77	77	70	90	70							
Growing Season Precip:		7.29	7.29	5.75	4.65	5							
Producer/Cooperator:				Barber	Birkeland	Udelhoven							

Table 2. 2001 Spring wheat test weight and protein performance in Central Montana.
Exp. 9900 Central Agricultural Research Center, Moccasin, MT

ID	Pedigree	----- Test Weight -----						----- Protein -----					
		Mocc	Mocc	Denton	Ft Benton	Winifred		Mocc	Mocc	Denton	Ft Benton	Winifred	
		Fallow	Recrop	Recrop	Recrop	Fallow	Average	Fallow	Recrop	Recrop	Recrop	Fallow	Average
		lbs/bu	lbs/bu	lbs/bu	lbs/bu	lbs/bu	lbs/bu	%	%	%	%	%	%
MTHW9904	MTHW9904	60.1	59.6	61.9	60.3	52.2	58.8	11.8	16.1	15.8	16.3	16.6	15.3
PI607557	Scholar	58.4	59.9	60.5	58.8	51.0	57.7	12.2	16.7	16.5	17.9	18.4	16.3
PI592761	Ernest	60.9	57.0	61.7	58.3	50.6	57.7	13.1	19.0	15.4	17.8	18.3	16.7
CI 17430	Newana	59.6	56.6	60.2	61.2	50.5	57.6	12.3	17.6	16.1	16.9	17.4	16.1
C982-324	Rambo	60.5	57.6	58.4	59.2	52.3	57.6	12.7	18.9	14.9	16.6	17.7	16.2
CI 17429	Lew	58.9	58.6	59.8	59.3	51.4	57.6	12.4	18.7	16.4	16.4	17.5	16.3
PI527682	Amidon	59.9	58.2	60.6	58.4	50.5	57.5	12.9	18.9	15.1	17.6	18.2	16.5
MT 9929	MT 9929	60.0	57.1	61.8	58.5	50.0	57.5	12.0	17.2	15.1	18.4	17.2	16.0
ND 695	Reeder	60.3	57.9	59.6	59.1	50.3	57.4	11.5	16.6	16.0	17.3	17.4	15.8
BZ992588	Conan	59.5	58.6	58.6	59.5	50.8	57.4	12.9	15.8	15.9	17.1	17.2	15.8
CI 13596	Fortuna	60.4	58.3	60.3	58.1	49.5	57.3	12.7	17.7	16.8	17.0	17.3	16.3
PI574642	McNeal	61.1	57.1	59.3	59.0	50.0	57.3	12.6	18.2	15.8	16.7	18.6	16.4
MTHW9710	MTHW9710	59.8	58.7	60.8	58.2	48.8	57.2	12.6	16.4	15.7	17.0	17.2	15.8
PI531005	Grandin	60.0	57.1	61.4	57.9	48.5	57.0	12.3	17.7	15.4	17.4	17.6	16.1
MT 9874	MT 9874	61.4	55.3	58.6	58.8	50.6	57.0	11.9	16.9	15.4	16.4	16.8	15.5
MTHW9420	MTHW9420	60.6	54.3	60.5	58.5	49.8	56.7	11.1	16.2	15.3	16.1	16.7	15.1
PI549275	Hi-Line	60.5	54.1	61.7	58.6	48.3	56.6	12.4	19.0	15.9	17.4	17.7	16.5
WB 926	Westbred 926	61.4	55.1	59.0	58.9	48.2	56.5	12.7	20.0	16.0	17.3	18.0	16.8
WBExpress	Express	59.2	56.8	58.8	57.5	49.8	56.4	13.0	16.3	15.5	16.5	16.7	15.6
WB 936	Westbred 936	59.7	53.2	60.9	58.6	48.5	56.2	11.9	19.0	15.3	18.0	17.6	16.4
Average		60.1	57.1	60.2	58.8	50.1	57.3	12.4	17.6	15.7	17.1	17.5	16.1
CV (s/mean)*100		3.2	2.2	2.3									
LSD (0.05)		ns	2.1	2.3									

Table 3. Moccasin recrop spring wheat multi-year summary of selected varieties.

Exp. 9970 Central Agricultural Research Center, Moccasin, MT.

Selected Varieties	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	Mean	McNeal Same Years
----- bu/a -----												
McNeal	39	52	22	45	24	63	37	42	33	33	39.0	-
Amidon	35	55	23	40	22	52	34	39	31	32	36.3	39.0
WestBred 926	29	51	23	42	23	58	36	34	31	32	35.9	39.0
Grandin	30	54	20	40	20	52	35	33	31	31	34.6	39.0
Fortuna	27	44	24	35	22	48	33	37	33	29	33.2	39.0
Rambo	34	43	23	39	21	55	33	36	31	28	34.3	39.0
Lew	34	46	20	36	19	52	35	35	29	30	33.6	39.0
Newana	35	48	25	47	23	49	35	36	31	32	36.1	39.0
Hi-Line	29	49	21	39	22	57	35	31	33	29	34.5	39.0
Ernest			21	40	20	48	34	30	30	27	31.2	37.3
Fergus				41	20	56	34	33	30	-	35.7	39.5
WB Express				39	23	57	34	40	31	34	36.9	39.5
WestBred 936				43	23	53	34	37	32	28	35.7	39.5
Scholar					24	51	33	35	33	35	35.2	38.6
MTHW 9420					23	66	38	37	33	31	38.0	38.6
Nursery Mean	31.1	48.1	22.4	40.4	21.9	54.8	34.5	35.5	31.6	31.3		
Precipitation in inches:												
(Apr - Jul)	9.1	12.1	8.0	13.4	5.7	11.3	9.4	6.6	7.3	7.3		

Table 4. Denton Re-Crop Spring Wheat Multi-Year Summary of Selected Varieties.

Exp. 9971 Central Agricultural Research Center, Moccasin, MT.

Selected Varieties	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	Mean	McNeal Same Years
McNeal	27	92	22	43	24	47	34	17	29	29	36.4	-
Amidon	23	83	23	39	23	47	30	14	28	30	34.0	36.4
WestBred 926	19	78	25	41	25	46	31	16	27	28	33.6	36.4
Grandin	25	81	24	36	20	44	32	15	26	28	33.1	36.4
Fortuna	17	66	20	33	22	42	32	18	29	26	30.5	36.4
Rambo	25	74	20	37	23	43	29	12	25	27	31.5	36.4
Lew	27	65	20	36	23	40	29	13	25	27	30.5	36.4
Newana	25	81	20	44	27	45	33	18	28	26	34.7	36.4
Hi-Line	26	76	23	45	23	46	32	12	26	27	33.6	36.4
Ernest			19	41	25	46	29	17	24	28	28.6	30.6
Fergus				36	26	43	28	15	23	-	28.5	31.8
WB Express				41	24	41	30	13	25	27	28.8	31.8
WestBred 936				39	26	43	35	16	26	31	30.8	31.8
Scholar					26	46	37	16	29	31	30.8	30.0
MTHW 9420					24	44	30	12	26	28	27.3	30.0
Nursery Mean	24	77	22	38	24	44	32	15	26.6	28		

Precipitation in inches:

(Apr - Jul)	6.8	15.6	7.3	12.7	5.4	10.8	11.7	5.3	8.3	6
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The variety trial was planted re-crop on pea ground in 1992, re-crop on buckwheat in 1996, and re-crop following millet in 1997. All other years the trial was planted on fallow ground.

Table 5. Fort Benton Re-Crop Spring Wheat Multi-Year Summary of Selected Varieties.

Exp. 9972 Central Agricultural Research Center, Moccasin, MT.

Selected Varieties	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	Mean	McNeal Same Years
	----- bu/a -----											
McNeal		18	47	37	45	32	22	28	14	10	27.4	-
Amidon	25	15	40	36	46	34	20	25	14	12	25.7	27.4
WestBred 926	31	11	41	34	37	34	21	17	14	6	24.4	27.4
Grandin	29	10	43	35	32	33	17	23	12	9	25.3	27.4
Fortuna	33	12	36	35	42	31	21	27	16	10	26.6	27.4
Rambo	27	15	43	36	46	35	19	24	13	11	26.7	27.4
Lew	24	23	41	31	43	32	21	26	13	11	26.0	27.4
Newana	29	14	42	32	39	33	19	22	15	11	25.6	27.4
Hi-Line	22	12	44	32	44	34	19	26	13	10	25.0	27.4
Ernest					45	34	19	21	13	11	23.6	25.2
Fergus					34	33	20	17	12	-	22.2	25.2
WB Express					41	33	19	17	11	8	21.2	25.2
WestBred 936					34	32	19	19	14	7	20.7	25.2
Scholar						36	19	20	16	12	19.4	21.2
MTHW 9420						30	19	20	14	8	23.1	21.2
Nursery Mean	28.2	14.2	40.8	34.3	40.8	32.9	19.1	22.4	13.6	10		

Precipitation in inches:

(Apr - Jul) 9.3 18.4 4.9 14.9 6.3 8.7 5.5 7.1 3.9 4.7

The 1991-1996 variety trials were located on Ron Long's farm; the 1997-2000 trials were located at the Birkeland farm. 1997 trial was abandoned due to an extreme wild oat infestation. All trials were planted on re-crop ground.

Table 6. Winifred Re-Crop Spring Wheat Multi-Year Summary of Selected Varieties.
Exp. 9973 Central Agricultural Research Center, Moccasin, MT.

Selected Varieties	1998	1999	2000	2001	Mean	McNeal Same Years
	----- bu/a -----					
McNeal	47	37	31	24	34.7	-
Amidon	40	31	27	28	31.6	34.7
WestBred 926	47	36	23	24	32.5	34.7
Grandin	46	36	28	22	33.0	34.7
Fortuna	39	36	29	24	31.9	34.7
Rambo	43	35	23	25	31.4	34.7
Lew	34	31	28	27	30.0	34.7
Newana	42	33	28	27	32.6	34.7
Hi-Line	46	35	27	26	33.5	34.7
Ernest	41	32	28	24	31.3	34.7
Fergus	44	34	24	-	34.0	34.7
WB Express	48	43	30	29	37.6	34.7
WestBred 936	53	38	27	26	36.1	34.7
Scholar	38	37	27	29	32.8	34.7
MTHW 9420	44	37	28	25	33.4	34.7
Nursery Mean	42.5	35.5	27.5	26.0		
Precipitation in inches: (Apr-Jul)	10.8	7.4	9.5	5.0		