

PROJECT TITLE: 2003 Evaluation of spring wheat variety performance in no-till recrop after pulse crop system near Moccasin.

PROJECT LEADER: D. M. Wichman, Agronomist, Moccasin, MT

PROJECT PERSONNEL: L. E. Talbert, Spring Wheat Breeder, Bozeman, MT
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OBJECTIVES:
Evaluate the agronomic performance of spring wheat varieties in recrop or continuous crop environments in central Montana.

RESULTS:
2003 Spring wheat variety trial following lentils was established at the Central Ag Research Center on land in its eighth year of continuous no-till annual cropping (since 1996). The current rotation is: pulse – spring wheat – canola/mustard – barley – barley – winter wheat – pulse crop. The Moccasin location experienced dry conditions through the winter than had much above average precipitation April through early May. The growing precipitation dwindled to almost nothing from June 10 through the first half of July. Field conditions at seeding were good with very little residue to obstruct the drill and good soil moisture. Cool temperatures through April into early May slow seed germination and seedling emergence. Dry conditions coupled with much above average temperatures in the mid to late growing season severely stressed the spring wheat. The droughty weather in combination with the variable shallow soils resulted in extremely variable yield results. The spring wheat ripen earlier than usual but harvest was delayed some because of conflict with other harvests.

Yield were 10 to 15 bushels below pre-plant expectations. The 20 entries averaged 19.3 bu/a with McNeal, Outlook and Fortuna topping the yield list (Table 1). When Fortuna is one of the top yielder it indicates it was not a good spring wheat year. Test weights were severely impacted with the nursery averaging 54.3 lbs/bu. Scholar had the high test weight at 57.8 lbs/bu and WB 926 and MTW9420 had tail end test weights at 51.8 and 51.9 lbs/bu. Protein contents ranged from 18.3% for McNeal down to 16.7 for MT 9918. Heading occurred over a 4 day period, June 28 to July 2 (d 183).

SUMMARY:
Drought conditions contributed to low yields and test weights and above normal grain protein levels. These trials continue to show how spring wheat varieties perform in less than ideal plant available water conditions.

FUTURE PLANS:
This trial will be continued in the same rotation.

Table 1 2003 Spring wheat variety trial recropped no-till into lentil stubble.
 Exp 9970 Central Agricultural Research Center, Moccasin, Montana

ID	PEDIGREE	HEADDAT	PLANTH	YIELD	TESTWT	Protein
PI574642	MCNEAL	182	27	22.5	53.6	18.30
MT 9874	OUTLOOK	183	25	22.2	52.4	17.40
CI 13596	FORTUNA	182	29	21.5	54.6	16.90
MT 9929	Choteau	181	24	21.3	56.0	16.70
C982-324	RAMBO	183	24	21.0	54.1	17.30
PI527682	AMIDON	182	28	20.8	55.9	16.90
WB 936	WESTBRED 936	180	26	20.6	52.0	18.20
CI 17429	LEW	183	29	20.2	52.9	18.00
ND 695	Reeder	182	26	19.9	56.6	17.00
PI607557	SCHOLAR	182	28	19.2	57.8	17.70
WB 926	WESTBRED 926	180	25	19.1	51.8	18.30
CI 17430	NEWANA	183	27	18.9	55.9	16.80
PI592761	ERNEST	182	27	18.4	54.5	17.90
MT 9918	MT9328/MT9419	179	29	18.1	55.5	16.70
PI549275	HI-LINE	181	25	17.6	53.7	18.20
MTHW9420	MT8182/MT8289	181	27	17.3	51.9	17.20
PI619086	EXPLORER	179	27	17.3	54.5	17.50
BZ992322	HANK	181	24	17.2	54.8	17.80
BZ992588	Conan	181	25	16.9	54.8	17.40
WBEXPRES	WESTBRED EXPRESS	180	25	15.8	52.4	17.00
	OVERALL MEAN	181.3	26.28	19.3	54.3	17.46
	CV (S/MEAN) %	0.204	9.92	15.5	2.037	
	LSD(0.05 by t)	0.6115	4.309	4.944	1.828	
Seed Date:	21-Apr-2003	Herbicide: Preplant glyphosate and bromoxynil + 2,4D				
Fertilizer:	10-10-10-5 w/seed	45 N preplant at urea in March				
Harvest Date:	8-Aug-2003	Precip: crop yr:	12.41"	GrowSea:	8.17"	

PROJECT TITLE: 2003 Evaluation of spring wheat variety performance in recrop systems near Denton and Fort Benton.

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Dave Philips, Fergus County Extension Agent, Lewistown, MT
Judee Wargo, Chouteau County Ext. Agent, Fort Benton, MT

OBJECTIVES:
Evaluate the agronomic performance of spring wheat varieties in recrop or continuous crop environments in the southern triangle and central Montana.

RESULTS:
The Fort Benton was frosted on the 26 June 03. The nursery was just at heading stage. The frost damaged heads, white appearance by July 1, occurred in streaks across the nursery. Heads in portions of some plots were totally sterile while others were nearly undamaged. The site was abandoned. The Denton location started the season with decent soil moisture. However, scarce precipitation was received through June and July resulting in low grain yield and low test weights.

Westbred 936, Scholar and Fortuna produced the nurseries high yields at 18.5, 18.5 and 18.4 bu/a, respectively (Table 1). Few varieties had significantly lower grain yields. The mean test weight was 54.6 lbs with Ernest having the high test weight at 56.2 lbs/bu. Westbred 926 and McNeal had the high protein content at 18.3%. Scholar, Reeder, Explorer, Outlook and Choteau have multi-year mean grain yields equal or greater than McNeal (Table 2).

SUMMARY:
Drought conditions contributed to low yields and test weights and above normal grain protein levels. These trials continue to show how spring wheat varieties perform in less than ideal plant available water conditions.

FUTURE PLANS:
Uncertain because of MAES budget restrictions. If able, spring wheat variety evaluations on recrop will continue at Moccasin, Denton, and Geraldine.

Table 1 2003 Denton recrop spring wheat variety trial.
 Exp 9971 Central Agricultural Research Center, Moccasin, Montana

ID	Pedigree	Plant Ht	Yield	Test Wt	Protein
		"	bu/a	lbs/bu	%
WB 936	WESTBRED 936	24	18.5	54.4	18.2
PI607557	SCHOLAR	25	18.5	56.2	17.7
CI 13596	FORTUNA	24	18.4	55.3	16.9
MT 9874	OUTLOOK	22	17.6	53.2	17.4
PI619086	EXPLORER	23	17.5	55.6	17.5
PI527682	AMIDON	24	17.5	56.0	16.9
WB 926	WESTBRED 926	25	17.4	53.0	18.3
BZ992588	Conan	22	17.4	55.9	17.4
MTHW9420	MTHW9420	22	17.3	53.3	17.2
C982-324	RAMBO	17	17.1	55.9	17.3
ND 695	Reeder	23	16.8	55.4	17.0
BZ992322	HANK	25	16.7	53.4	17.8
WBEXPRES	WESTBRED EXPRESS	21	16.4	53.1	17.0
MT 9918	MT9328/MT9419	22	16.4	54.3	16.7
CI 17430	NEWANA	21	16.3	55.6	16.8
PI592761	ERNEST	24	16.1	56.2	17.9
MT 9929	MT9401/MT9328	21	16.0	55.8	16.7
CI 17429	LEW	23	15.6	54.2	18.0
PI574642	MCNEAL	23	15.5	53.0	18.3
PI549275	HI-LINE	20	14.6	52.9	18.2
	OVERALL MEAN	22.55	16.88	54.64	17.5
	CV (S/MEAN) %		8.788	1.46	
	LSD(0.05 by t)		2.451	1.319	
Seed Date:	28-Apr-2003				
Fertilizer:	10-10-10-05 w/seed.	54 N soil test	30 TD urea N		
Harvest Date:	15-Aug-2003	Decent soil moisture at seeding			

Table 2 Denton recrop spring wheat multi-year yield summary of selected varieties, 1992-2003
 Exp. 9971 Central Agricultural Research Center.

Selected Varieties	Year:	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	Ave.	McNeal Same Yrs
		----- bu/a -----													
McNeal		27	92	22	43	24	47	34	17	29	29	22	15	33.4	
Fortuna		17	66	20	33	22	42	32	18	29	26	19	18	28.5	33.4
Rambo		25	74	20	37	23	43	29	12	25	27	18	17	29.2	33.4
Lew		27	65	20	36	23	40	29	13	25	27	20	16	28.4	33.4
Hi-Line		26	76	23	45	23	46	32	12	26	27	23	15	31.1	33.4
Ernest				19	41	25	46	29	17	24	28	18	16	26.3	28.2
WB Express					41	24	41	30	13	25	27	--	16	27.2	28.9
WestBred 936					39	26	43	35	16	26	31	21	18	28.3	28.9
Scholar						26	46	37	16	29	31	21	18	28.0	27.1
MTHW 9420						24	44	30	12	26	28	20	17	25.2	27.1
Reeder (ND 695)									18	28	32	24	17	23.8	22.4
Conan (BZ 992588)									14	26	28	22	17	21.5	22.4
Explorer (MTHW9710)										27	29	24	18	24.4	23.8
Outlook (MT 9874)											29	24	18	23.7	22.0
Choteau (MT 9929)											30	21	16	22.3	22.0
Nursery Mean		24.0	77.0	22.0	38.0	24.0	44.0	32.0	15.0	26.6	28.0	21.1	16.9		

The variety trial was planted re-crop on pea ground in 1992, re-crop on buckwheat in 1996, re-crop following millet in 1997, and lentils in 2002 & 03. All other years the trial was planted on fallow ground.

PROJECT TITLE: 2003 Evaluation of spring wheat variety performance in no-till fallow near Winifred.

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OBJECTIVES:
Evaluate the agronomic performance of spring wheat varieties in crop-fallow environment in central Montana on deeper clay soils near Winifred.

RESULTS:
Spring moisture was initially good. The combination of strong winds and muddy soils made it difficult for producers to get their spring crop in. The droughty conditions that set in by the first week of June resulted in poor spring crops with each delay in planting resulting further reduced yield potential. The spring wheat test site was seeded on the 2-May-03. Soil conditions were barely dry enough to get on the soil to seed. Swales had to be avoided or the tractor would cut ruts. In fact the pickup became stuck when crossing a field to the research site. What started with such optimism ended in a slim crop as the rains shut off and the heat turned on. The cooperating farmer did not get his spring wheat seeded till after the 21-May. The trial averaged 18.3 bu/a while the farmers wheat around the plot averaged 4.1 bu/a. The impact was equal to 0.75 bu/a loss per day of delayed seeding.

Outlook had the nursery high yield at 20.1 bu/a followed by Fortuna and Reeder with yields of 19.8 and 19.3 bu/a, respectively (Table 1). The nursery mean yield was 18.3 bu/a. Newana and Scholar had the high test weights at 58.6 and 58.2 lbs/bu, respectively, while the nursery mean was 55.2 lbs/bu. WB Express, Reeder, WB 936 and Outlook have multi-year mean yields equal or greater than McNeal (Table 2).

SUMMARY:
The weather continues to frustrate spring wheat production in central Montana. Drought conditions contributed to low yields and test weights and above normal grain protein levels. These trials continue to show how spring wheat varieties perform in less than ideal plant available water conditions. The 18.3 spring wheat nursery average versus the winter wheat nursery mean yield of 43.4 bu/a shows why producer in much of central Montana will plant winter wheat when ever it is feasible.

FUTURE PLANS:
This trial will be continued in the same rotation.

Table 1 2003 Winifred chemical fallow spring wheat variety trial.
Exp 9974 Central Agricultural Research Center, Moccasin, Montana

ID	Pedigree	Plant Ht	Yield	Test Wt	Protein
MT 9874	OUTLOOK	24	20.1	53.4	15.5
CI 13596	FORTUNA	28	19.8	56.0	17.2
PI619086	EXPLORER	23	19.6	55.8	16.9
ND 695	Reeder	23	19.3	56.6	16.6
BZ992588	Conan	22	19.0	57.4	17.1
WB 926	WESTBRED 926	25	19.0	53.1	17.8
PI607557	SCHOLAR	27	18.9	58.2	16.8
BZ992322	HANK	23	18.8	54.3	17.3
PI574642	MCNEAL	25	18.7	53.7	18.3
WBEXPRES	WESTBRED EXPRESS	22	18.7	55.0	16.5
PI592761	ERNEST	27	18.7	56.4	17.5
WB 936	WESTBRED 936	25	18.7	53.3	17.5
CI 17430	NEWANA	24	18.1	58.6	16.3
MTHW9420	MT8182/MT8289	24	18.0	52.9	17.2
C982-324	RAMBO	22	17.9	55.9	17.6
PI549275	HI-LINE	23	17.4	54.4	18.3
CI 17429	LEW	26	16.9	54.0	17.8
PI527682	AMIDON	26	16.9	55.7	17.5
MT 9929	MT9401/MT9328	20	16.4	55.6	16.6
MT 9918	MT9328/MT9419	26	15.9	53.9	16.5
	Mean	24.3	18.34	55.2	17.14
	CV (S/MEAN) %	0	8.863	1.663	
	LSD(0.05 by t)	0	2.687	1.517	

Seed Date: 2-May-03 Moist Soil depth: 42"
Fertilizer: 10-10-10-5 w/seed 60 N urea top dress
Harvest Date: 13-Aug-03

Table 2 Winifred multi-year yields of selected spring wheat varieties, 1998-2003
Exp. 9973 Central Agricultural Research Center, Moccasin, MT

Variety	Test ID	1998	1999	2000	2001	2002	2003	Ave.	McNeal
		----- bu/a -----							Same Yrs
McNeal		47	37	31	24	42	19	33	
Fortuna		39	36	29	24	38	20	31	33
Rambo		43	35	23	25	36	18	30	33
Lew		34	31	28	27	36	17	29	33
Hi-Line		46	35	27	26	42	17	32	33
Ernest		41	32	28	24	34	19	30	33
WB Express		48	43	30	29	42	19	35	33
WestBred 936		53	38	27	26	41	19	34	33
Scholar		38	37	27	29	41	19	32	33
MTHW 9420		44	37	28	25	42	18	32	33
Conan	(BZ 992588)	--	37	22	29	40	19	29	31
Reeder	(ND 695)	--	40	30	30	44	19	33	31
Explorer	(MTHW9710)			27	25	39	20	28	29
Outlook	(MT 9874)	--	--	--	28	40	20	29	28
Choteau	MT 9929				24	38	16	26	28
Nursery Mean		43	36	28	26	40	18	32	