

PROJECT TITLE: 2003 Evaluation of winter wheat variety performance on no-till recrop into undisturbed barley stubble near Moccasin.

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

PROJECT PERSONNEL: P. L. Bruckner, Winter Wheat Breeder, Bozeman, MT
J. E. Berg, Winter Wheat Research Assoc., Bozeman, MT
J. Vavrovsky, Research Specialist, Moccasin, MT
Dave Philips, Fergus County Extension Agent, Lewistown, MT
Judee Wargo, Chouteau County Ext. Agent, Fort Benton, MT

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

RESULTS:
2003 Winter wheat variety trial re-cropped no-till after barley 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. Soil moisture conditions were fair to good at seeding (soil moisture probe depth 10-12”). However, high post seeding temperatures and winds dried the soil late into the fall. Much above average April precipitation contributed to excellent yield potential. Return of severe drought conditions in early June resulted low test weights which deflated the yield levels. The droughty weather in combination with the variable shallow soils resulted in extremely variable yield results and low confidence results.

Promontory and a Promontory x Judith cross (MT00159) produced the highest yields with 49.4 and 41.6 bu/a, respectively (see Table 1). Promontory also has an eight year average yield (42.3 bu/a) slightly higher than Neeley (41.8 bu/a) for the same years (Table 2). Rocky and Promontory are the only two entries that have a multi-year mean yield greater than Neeley. Test weights were extremely low, nursery mean 52.0 lbs/bu, due to the severe drought stress from late June through ripening (Table 1). Rocky had the nursery highest test weight at 55.0 lbs per bu and was the first to head. Proteins were expectedly high with Big Sky and Tiber topping the nursery protein content at 17.3% and 17.2 %, respectively.

SUMMARY:
2003 No-Till recrop weather precipitation conditions were such that early maturity was favored. The later the maturity the greater the exposure to increased heat and reduced plant available moisture. The main factor missing was winter stress. The good performance of several numbered lines indicate the potential for improved varieties in the near future.

FUTURE PLANS:
Winter wheat variety evaluations will continue at Moccasin.

Table 2. Moccasin recrop winter wheat multi-year, 1993-2003, yield summary of selected varieties.
Exp. 3870 Central Agricultural Research Center, Moccasin, Montana.

Selected Varieties	1993	1995	1996	1997	1998	1999	2000	2001	2002	2003	avg	Neeley Same Yrs
	----- bu/a -----											
Neeley	44	33	31	69	47	45	43	36	34	38	42.0	42.0
Norstar	39	33 ^{1/}	26	54	45	41	40	32	34	23	37.1	42.0
Rocky	40	39	34	73	50	43	45	39	31	38	43.2	42.0
Tiber	45	36	29	56	46	45	41	39	35	33	40.5	42.0
Judith	36	40	31	63	53	43	46	36	38	30	41.6	42.0
Quantum 542	38	30	30	66	52	53	39	-			44.0	42.0
Bighorn	35	40	28	65	48	42	44	37	34	31	40.4	42.0
NuWest	-	38	30	51 ^{2/}	50	39	40	37	38	30	37.7	42.0
Erhardt		35	28	63	44	30	37	32	-		38.4	43.4
Vanguard		27 ^{1/}	27	59	47	38	39	34	35	30	38.6	42.0
Rampart		36	27	55 ^{2/}	48	38	37	33	-	31	35.7	42.7
McGuire		31	28	53	36	32	36	30	31		34.6	42.5
Promontory			29	61	50	48	46	36	39	49	44.8	43.0
BigSky				65	47	39	40	37	36	27	41.5	45.0
Morgan						42	38	35	36	35	37.1	39.0
Mean	37	37	29	61	47	42	41	35.2	36	35	40.0	

^{1/} Suspected low germination resulted in low yields. ^{2/} Yields from one rep only.

1994 trial was abandoned due to variable stand as a result of extremely wet conditions at seeding.

Table 1 2003 No-till recrop winter wheat at Moccasin
 Exp 3870 Central Agricultural Research Center. Moccasin, Montana.

ID	Variety	Headdate d of y	Plant Ht "	Yield bu/a	Test Wt lbs/bu	Protein %
PI555458	PROMONTORY	168	29	49.4	50.3	15.9
MT00159	Promontory/Judith	170	29	41.6	51.4	15.9
S94-4	CDC FALCON	169	29	38.9	53.1	15.3
BZ96-919	PRYOR	171	27	38.7	48.6	15.5
PI586806	NUWEST	169	30	38.5	53.2	15.6
MT9426	PAUL	169	33	38.4	47.4	15.5
MTI01158	Fidel/Tiber	168	33	38.3	53.3	16.0
MT0097	Erhardt//Judith/Kestrel	169	31	38.1	53.4	15.8
CI 17860	NEELEY	171	29	37.9	49.2	16.3
ND9257	JERRY	170	33	37.9	53.4	15.6
CI 17879	ROCKY	167	35	37.6	55.0	15.6
MT9982	Promontory/Judith	170	29	37.4	52.3	15.7
MTS0031	MTS92015//Vanguard/Norstar	169	34	36.9	53.8	16.1
PI599336	MORGAN	171	30	34.6	52.8	15.6
MT9989	Blizzard/Arapahoe	168	29	33.8	48.2	16.3
PI517194	TIBER	170	32	33.3	52.1	17.2
MTW9441	NUSKY	168	35	31.5	54.4	14.9
PI593889	RAMPART	169	34	30.9	54.8	15.8
RH78W296	BIGHORN	168	30	30.9	53.6	16.2
PI593891	VANGUARD	167	31	29.9	54.5	16.7
PI584526	JUDITH	167	28	29.7	47.5	16.4
MTR9997	PI262605/MT7863//Redwin	168	32	29.1	51.4	16.2
MT 9432	BIGSKY	168	34	26.7	52.2	17.3
CI 17735	NORSTAR	173	34	22.5	55.4	15.4
OVERALL MEAN =		169.0	31.25	35.11	52.1	16.0
CV (S/MEAN) % =		0.52		21.12		
LSD(0.05 by t)=		1.44		12.19		
Seeding Date: 26-Sep-02		No-till into 2002 barley stubble.				
Fertilizer: 10-10-10-05 w/seed		90 N topdress Urea				
Harvest Date: 28-Jul-03		crop 12.41" row Seasc 8.17"				

PROJECT TITLE: 2003 Evaluation of winter wheat variety performance in recrop trials near Denton.

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

PROJECT PERSONNEL: P. L. Bruckner, Winter Wheat Breeder, Bozeman, MT
J. E. Berg, Winter Wheat Research Assoc., Bozeman, MT
J. Vavrovsky, Research Specialist, Moccasin, MT
Dave Philips, Fergus County Extension Agent, Lewistown, MT

OBJECTIVES:

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

RESULTS:

2003 Denton winter wheat variety trial was re-cropped till-plant after hay barley. Moist soil depth at seeding was 15-18". Stand survival was good. Yields were slightly below average due droughty conditions through the winter and late spring. Deeper soil moisture allowed the kernels to develop and produce average test weights.

Pryor and Promontory were the two highest yielding varieties with 43.4 and 42.9 bu/a, respectively. Two selections from Promontory crosses placed third and fourth in yield. Once again, Rocky had the nursery high test weight with 62.5 lbs per bushels compared to a nursery mean of 60.5 lbs per bushel. MT0097 and Bighorn had the highest protein contents at 14.4 and 14.3%, respectively. The Neeley protein content is un-expectedly high. This may be due to a human error or a chance fluke protein sample. A single sample from a single rep is utilized to determine protein levels. This data point shows why more than one rep per treatment is preferred. Judith, Quantum 542 and Promontory are the only entries with multi-year yield means the same as or above Neeley at the Denton location (Table 2).

SUMMARY:

2003 No-Till recrop weather precipitation conditions were such that early maturity was favored. The later the maturity the greater the exposure to increased heat and reduced plant available moisture. The main factor missing was winter stress.

FUTURE PLANS:

Winter wheat variety evaluations will continue at Denton a continuous crop environment if possible. Richard Barber will be the cooperater as he has provided excellent exposure for this site through his seed plant's field tours.

Table 1 2003 Denton winter wheat variety performance on tilled hay barley recrop.
Exp 3871 Central Agricultural Research Center, Moccasin, Montana

ID	Variety	Plant Ht	Yield	Test Wt	Protein
		"	bu/a	lbs/bu	%
BZ96-919	PRYOR	29	43.4	60.4	12.2
PI555458	PROMONTORY	33	42.9	62.5	12.3
MT00159	Promontory/Judith	33	41.9	60.0	12.8
MT9982	Promontory/Judith	33	41.5	60.7	13.1
S94-4	CDC FALCON	30	40.6	61.5	13.5
MT9989	Blizzard/Arapahoe	35	40.6	59.9	12.5
MT9426	PAUL	32	39.3	59.4	13.0
PI584526	JUDITH	36	37.6	58.8	13.9
MTR9997	PI262605/MT7863//Redwin	33	37.5	61.5	13.2
MTS0031	MTS92015//Vanguard/Norstar	35	37.4	60.8	14.2
CI 17860	NEELEY	34	37.1	59.9	14.2
ND9257	JERRY	34	37.0	61.1	12.8
PI593891	VANGUARD	34	36.1	60.7	13.7
MTI01158	Fidel/Tiber	32	35.6	61.6	13.6
MT 9432	BIGSKY	36	35.6	61.4	13.7
CI 17879	ROCKY	33	35.4	62.5	13.4
PI517194	TIBER	37	35.1	61.4	12.9
MTW9441	NUSKY	33	34.3	60.1	11.7
RH78W296	BIGHORN	29	34.0	60.3	14.3
PI586806	NUWEST	34	33.8	60.0	12.8
MT0097	Erhardt//Judith/Kestrel	34	32.6	59.2	14.4
PI599336	MORGAN	34	32.3	59.0	13.4
PI593889	RAMPART	34	32.1	58.7	13.9
CI 17735	NORSTAR	36	28.9	60.7	12.3
	OVERALL MEAN =	33.46	36.8	60.5	13.2
	CV (S/MEAN) % =		5.485	1.876	
	LSD(0.05 by t)=		3.315	1.865	

Seed date: 20-Sep-2002

Fertilizer: w/seed none inadvertently shutoff. 60 N pre plant anhydrous.

Harvest Date: 25-Aug-2003 Soil water: 1.5 at seeding.

Table 2 Denton recrop winter wheat multi-year yield summary of selected varieties, 1990-2003
 Exp. 3801 Central Agricultural Research Center, Moccasin, MT

Selected Varieties	1990	1991	1992	1993	1995	1996	1997	1998	1999	2001	2002	2003	average	Neeley Same Yrs
	----- bu/a -----													
Neeley	55	64	24	66	82	44	62	61	45	48	51	37	53	53
Norstar	44	39	24	55	51 ^{1/}	35	54	51	35	40	44	29	41	53
Rocky	50	60	22	57	73	46	59	61	40	31	53	35	49	53
Tiber	52	55	28	65	73	42	65	61	46	45	49	35	51	53
Judith	59	61	26	55	87	45	59	66	45	42	54	38	53	53
Quantum 542	57	--	40	59	78	48	67	76	48	--	--		59	55
Bighorn	48	60 ^{2/}	23	56	73	46	64	67	39	30	52	34	48	53
NuWest	50	54	--	--	67	43	64	59	45	39	51	34	51	55
Vanguard					56	41	56	62	35	34	46	36	46	54
Rampart					76	40	51	55	37	33	--	32	46	46
Paul (MT 9426)										41	46	39	42	45
Promontory						53	56	65	47	37	52	43	50	50
BigSky							64	62	44	39	46	36	48	51
Morgan									46	34	49	32	40	45
Nursery Mean	49	53	22	56	73	43	60	60	42	36	49	37	48	53

1/ Suspected low germination resulted in low yields. 2/ Bighorn was planted on one end of the trial.
 1994 stand was variable due to wind damaged. Thus abandoned.
 1999 two reps were harvested . 2000 yields not reported due to plugged drill opener in some rows.

PROJECT TITLE: Evaluation of winter wheat variety performance in under fallow near Winifred.

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

PROJECT PERSONNEL: P. L. Bruckner, Winter Wheat Breeder, Bozeman, MT
J. E. Berg, Winter Wheat Research Assoc., Bozeman, MT
J. Vavrovsky, Research Specialist, Moccasin, MT
Dave Philips, Fergus County Extension Agent, Lewistown, MT

OBJECTIVES:
Evaluate agronomic performance of winter wheat varieties in crop-fallow environments in the central Montana.

RESULTS:
2003 Winter wheat trials were established on tilled fallow near Winifred. Soil moisture was fair to good. The soil had dried since the early September moisture. Winter survival was good. Good spring moisture provided for excellent growth. The deep soils stored sufficient water for decent seed density in spite of the hot dry conditions experienced in the mid late growing season. The two previous winter wheat trials at Winifred were not harvested.

Promontory produced the highest nursery yield and test weight at 52.3 bu/a and 62,9 lbs/bu. compared to the nursery means of 43.4 bu/a and 58. lbs/bu., respectively. Vanguard had the high grain protein content at 16.3 followed by Rampart and Big Sky, both with 16.1 % protein.

SUMMARY:
In spite of the mid to late growing season drought and extreme heat the winter wheat on the deep clay soils was able to produce a good yields with good quality. Promontory continues to perform well in the central Montana environment. The recent Montana releases Big Sky, Rampart and Vanguard continue to set the standard for protein content.

FUTURE PLANS:
Winter wheat variety evaluations will continue at Winifred.

Table 1 2003 Winifred winter wheat variety performance on tilled fallow.
Exp 3874 Central Ag Research Center, Moccasin, Montana

ID	Variety	Plant Ht	Yield	Test WT	Protein	Moisture
		"	bu/a	lbs/bu	%	%
PI555458	PROMONTORY	32.8	52.3	62.9	13.9	7.5
MT00159	Promontory/Judith	32.5	50.5	58.6	14.9	8.5
MTW9441	NUSKY	36.9	49.1	60.7	12.5	8.0
BZ96-919	PRYOR	31.9	48.5	56.2	15.6	7.3
RH78W296	BIGHORN	32.1	46.0	58.9	14.5	7.8
CI 17879	ROCKY	35.6	45.0	59.3	15.0	7.5
ND9257	JERRY	35.9	44.4	58.8	13.9	8.0
MTI01158	Fidel/Tiber	34.3	44.3	58.3	15.4	8.1
MT9982	Promontory/Judith	32.9	43.9	57.9	15.2	8.3
MTR9997	PI262605/MT7863//Redwin	34.5	43.2	60.5	15.2	7.7
MT9989	Blizzard/Arapahoe	34.1	43.2	56.2	15.1	8.2
PI586806	NUWEST	34.7	42.8	59.5	15.4	7.6
PI584526	JUDITH	33.9	42.8	56.0	15.1	8.0
MTS0031	MTS92015//Vanguard/Norstar	34.7	42.5	59.4	13.4	7.6
MT0097	Erhardt//Judith/Kestrel	31.2	42.5	58.7	14.6	8.0
S94-4	CDC FALCON	28.8	42.1	58.1	14.1	7.3
PI593891	VANGUARD	33.2	41.7	57.0	16.3	7.6
CI 17860	NEELEY	33.6	41.5	58.5	14.4	8.0
MT 9432	BIGSKY	35.2	41.1	59.3	16.1	7.5
MT9426	PAUL	30.9	41.1	57.5	12.4	8.1
PI593889	RAMPART	35.5	40.9	59.8	13.4	7.7
PI517194	TIBER	35.3	40.6	57.4	16.1	7.6
PI599336	MORGAN	33.3	38.2	57.3	15.0	7.4
CI 17735	NORSTAR	36.7	34.4	59.6	14.8	7.8
	Mean	33.8	43.4	58.6	14.7	7.8
	CV (S/MEAN) % =		12.4			
	LSD(0.05 by t)=		8.84 ns			

Seed date: 1-Oct-02
Fertilizer: 10-10-10-5 w/seed 60 lbs N
Harvest Date: 29-Jul-03