

PROJECT TITLE: Off-station variety testing of winter and spring wheat, spring barley, and triticale in Central Montana.

PRINCIPAL INVESTIGATOR: Grant D. Jackson, Central Ag. Research Center, Moccasin

CO-PRINCIPAL INVESTIGATORS: Eugene Hockett-Winter wheat
Luther Talbert-Spring wheat
Tom Blake-Spring barley

OBJECTIVE: Evaluate small grain variety performance in Central Montana.

RESULTS: Results of the winter wheat nurseries are shown in tables 1 through 4. The high grain yield performance of Judith, QT 542, and Neeley were consistent across locations this year. Spring grain nurseries were harvested at Moccasin, Highwood, and Denton; Geraldine was hailed out. Spring wheat performance (tables 5 through 7) was inconsistent with the exception of Penawawa, a soft white variety. Yields and visual observations of Newana in these nurseries indicate a probable mixup with seed sources (compare yields of Newana in the spring wheat and triticale nurseries). Triticale data are summarized in tables 8 through 10. Performance of Sunland was the most consistent this year. Barley variety summaries are included in tables 11 through 13; barley performance was inconsistent this year.

FUTURE PLANS: Continue off-station variety testing.

TABLE 1. OFF-STATION WINTER WHEAT VARIETY TRIAL - MOORE
 Central Ag. Research Center, Moccasin, MT 1990

VARIETY	GRAIN YIELD	TEST WT.	PLANT HT.
	bu/ac	lb/bu	in
MT7811 FRD/WNK//MT6928/TDR	47.2	59.1	33
RH78W296 BIGHORN	42.0	59.7	30
QT542 HYBRITECH	41.4	57.9	35
CI17902 WINRIDGE	40.6	56.0	32
CI13190 WARRIOR	37.2	58.4	36
CI17844 REDWIN	36.9	60.5	36
MT8039 JUDITH	36.2	55.6	32
CI13670 WINALTA	35.3	59.6	39
CI15075 CENTURK	35.3	58.0	31
CI17735 NORSTAR	34.6	59.8	39
CI17860 NEELEY	34.5	58.5	33
CI8885 CHEYENNE	34.4	59.5	42
PI149152 CREE	33.5	59.8	39
PI151714 TIBER	33.5	59.6	35
PI149153 NORWIN	30.3	59.7	26
CI17879 ROCKY	29.2	58.2	37
EXPERIMENTAL MEANS	36.4	58.7	
F TEST FOR VAR.	2.63	8.29	
C.V. 1: (S/MEAN)*100	13.35	1.41	
C.V. 2: (S OF MEAN/MEAN)*100	7.71	.81	
LSD (0.05)	8.1	1.4	

Grain yield based on 60 lb/bu as standard test weight.
 Planting Date: Sept. 12, 1989
 Fertilizer: 57-30-0
 Previous crop: Fallow

TABLE 2. OFF-STATION WINTER WHEAT VARIETY TEST - HIGHWOOD
Central Ag. Research Center, Moccasin, MT 1990

VARIETY	GRAIN YIELD	TEST WT.	PLANT HT.
	bu/ac	lb/bu	in
QT542 HYBRITECH	69.9	63.2	36
MT8039 JUDITH	66.8	61.3	36
CI17860 NEELEY	63.5	63.1	32
CI8885 CHEYENNE	62.0	63.7	38
RH78W296 BIGHORN	59.2	62.2	29
CI17902 WINRIDGE	58.7	61.7	32
PI151714 TIBER	58.5	63.0	36
MT7811 FRD/WNK//MT6928/TDR	58.1	60.4	33
PI149152 CREE	57.7	63.1	38
CI17879 ROCKY	55.9	62.9	36
CI17844 REDWIN	55.3	62.6	34
CI15075 CENTURK	55.0	62.6	35
CI13190 WARRIOR	53.8	62.9	38
CI17735 NORSTAR	53.1	62.7	36
PI149153 NORWIN	53.0	62.7	26
CI13670 WINALTA	49.6	63.6	38
EXPERIMENTAL MEANS	58.1	62.6	
F TEST FOR VAR.	5.42	3.52	
C.V. 1: (S/MEAN)*100	6.80	1.25	
C.V. 2: (S OF MEAN/MEAN)*100	3.93	.72	
LSD (0.05)	6.6	1.3	

Grain yield based on 60 lb/bu as standard test weight.

Planting Date: Sept. 25, 1989

Fertilizer: 80-30-0

Previous crop: Burned barley stubble

TABLE 3. OFF-STATION WINTER WHEAT VARIETY TEST - DENTON
 Central Ag. Research Center, Moccasin, MT 1990

VARIETY	GRAIN YIELD	PLANT HT.	TEST WT.
	bu/ac	in	lb/bu
MT8039 JUDITH	59.37	38	60.97
QT542 HYBRITECH	56.87	41	61.20
CI17860 NEELEY	54.60	36	61.37
PI151714 TIBER	52.00	40	61.40
MT7811 FRD/WNK//MT6928/TDR	50.43	36	61.07
CI17844 REDWIN	49.93	40	61.93
CI17879 ROCKY	49.50	42	61.93
CI15075 CENTURK	48.07	39	62.03
RH78W296 BIGHORN	47.97	32	61.87
PI149152 CREE	47.07	41	62.83
PI149153 NORWIN	47.03	28	62.40
CI8885 CHEYENNE	46.47	41	62.73
CI17902 WINRIDGE	46.10	38	61.47
CI13190 WARRIOR	44.93	39	61.20
CI17735 NORSTAR	43.73	44	62.03
CI13670 WINALTA	39.90	43	61.77
EXPERIMENTAL MEANS	49.00	.00	61.76
F TEST FOR VAR.	7.45	.00	4.30
C.V. 1: (S/MEAN)*100	6.38	.00	.77
C.V. 2: (S OF MEAN/MEAN)*100	3.68	.00	.44
LSD (0.05)	5.2		.8

Grain yield based on 60 lb/bu as standard test weight.
 Planting Date: Sept. 14, 1989
 Fertilizer: 46-30-0
 Previous crop: Fallow

TABLE 4. OFF-STATION WINTER WHEAT VARIETY TEST-GERALDINE
Central Ag. Research Center, Moccasin, MT 1990

VARIETY	GRAIN YIELD	PLANT HT.	TEST WT.
	bu/ac	in	lb/bu.
MT8039 JUDITH	45.00	40.27	60.75
PI149153 NORWIN	44.70	30.50	61.45
QT542 HYBRITECH	44.55	43.01	60.05
CI17860 NEELEY	44.45	36.75	61.15
PI151714 TIBER	44.25	40.27	62.20
RH78W296 BIGHORN	41.55	34.80	76.20
CI8885 CHEYENNE	39.90	42.23	61.30
CI15075 CENTURK	39.90	39.10	61.70
CI13190 WARRIOR	39.85	39.88	61.80
CI17902 WINRIDGE	38.90	39.10	61.40
PI149152 CREE	38.10	34.41	63.20
MT7811 FRD/WNK//MT6928/TDR	37.90	37.15	60.50
CI17879 ROCKY	37.05	40.27	60.75
CI17844 REDWIN	33.65	40.66	60.05
CI13670 WINALTA	33.05	44.97	62.30
CI17735 NORSTAR	31.05	43.01	61.00
EXPERIMENTAL MEANS	39.62		62.24
F TEST FOR VAR.	1.73		.96
C.V. 1:	11.99		8.84
C.V. 2:	8.48		6.25
LSD (0.05)	NS		NS

CAUTION-NURSERY WAS SEVERLY DAMAGED BY HAIL.

NS denotes means are not significantly different at $p=0.05$.
Grain yield based on 60 lb/bu as standard test weight.

Planting Date: Sept. 25, 1989

Fertilizer: 66-30-0

Previous crop: Fallow

TABLE 5. OFF-STATION HARD RED SPRING WHEAT NURSERY
Central Ag. Research Center, Moccasin, MT 1990

VARIETY	GRAIN YIELD	TEST WT.	PLANT HT.	HEADING DATE
	bu/ac	lb/bu	in	
ND 618 GUS	24.5	57.7	25	181
CANLANC LANCER	23.9	58.6	30	181
WA 6920 PENAWAWA	23.8	57.3	25	182
NDCUT CUTLESS	23.2	59.3	28	181
CI 17904 OWENS	22.6	56.6	27	181
ND 626 GRANDIN	21.6	57.5	26	181
WPB 906R WESTBRED 906R	21.0	58.3	26	179
PI483235 GLENMAN	20.7	57.7	24	182
C982-324 RAMBO	20.6	59.2	24	182
CI 17910 ALEX	20.5	59.1	28	181
WPB 926R WESTBRED 926R	20.1	58.3	27	179
ND 606 AMIDON	20.0	58.5	28	181
ND 582 STOA	19.6	56.4	26	181
MT 8402 MT7336/SHORTANA	19.3	55.8	23	180
CI 17790 LEN	19.2	55.9	27	179
CI 17430 NEWANA	19.1	58.8	23	182
CI 17828 PONDERA	18.6	59.1	26	180
CI 17429 LEW	17.7	58.4	27	183
CI 15930 OLAF	17.6	57.3	24	180
CI 13596 FORTUNA	14.8	59.1	25	181
EXPERIMENTAL MEANS	20.4	57.9	26	181
F TEST FOR VAR.	2.67	11.09	3.66	56.78
C.V. 1: (S/MEAN)*100	12.52	1.01	6.25	.14
C.V. 2: (S OF MEAN/MEAN)*100	7.23	.58	3.61	.08
LSD (0.05)	4.2	.96	3	1

Grain yield based on 60 lb/bu as standard test weight.

Planting date: April 18, 1990

Growing season precipitation (April-July): 6.24 in.

Fertilizer: 66-30-0, 60 lbs/ac of 11-53-0 with seed, 60 lbs of N/ac as urea broadcast and incorporated prior to seeding.

Previous crop: Fallow

TABLE 6. OFF-STATION HARD RED SPRING WHEAT NURSERY - HIGHWOOD
Central Ag. Research Center, Moccasin, MT 1990

VARIETY	GRAIN YIELD	TEST WT.	PLANT HT.
	bu/ac	lb/ac	in
WA 6920 PENAWAWA	48.2	60.8	27
ND 606 AMIDON	44.7	61.0	35
WPB 926R WESTBRED 926R	43.7	60.0	28
CI 17828 PONDERA	41.0	61.6	27
ND 626 GRANDIN	40.8	61.3	30
MT 8402 MT7336/SHORTANA	40.3	59.2	27
CI 17429 LEW	39.6	61.5	37
WPB 906R WESTBRED 906R	39.3	58.9	26
PI483235 GLENMAN	38.9	59.0	32
CI 17904 OWENS	38.5	58.6	27
CI 15930 OLAF	38.2	60.7	31
ND 582 STOA	37.9	60.0	33
ND 618 GUS	37.2	61.1	30
CI 17790 LEN	36.8	60.5	26
CI 13596 FORTUNA	36.5	61.0	37
CANLANC LANCER	36.0	61.7	36
CI 17910 ALEX	35.7	61.4	34
C982-324 RAMBO	35.5	60.2	27
NDCUT CUTLESS	35.5	61.0	29
CI 17430 NEWANA	34.8	59.5	27
EXPERIMENTAL MEANS	38.9	60.4	
F TEST FOR VAR.	3.60	4.88	
C.V. 1: (S/MEAN)*100	8.12	1.26	
C.V. 2: (S OF MEAN/MEAN)*100	4.69	.73	
LSD (0.05)	5.2	1.3	

Grain yield based on 60 lb/bu as standard test weight.

Planting date: April 25, 1990

Growing season precipitation (April-July): in.

Fertilizer: 80-30-0, 60 lbs/ac of 11-53-0 with seed, 80 lbs of N/ac as
anhydrous ammonia incorporated prior to seeding.

Previous crop: Spring wheat

TABLE 7. OFF-STATION HARD RED SPRING WHEAT NURSERY - DENTON
 Central Ag. Research Center, Moccasin, MT 1990

VARIETY	GRAIN YIELD	TEST WT.	PLANT HT.
	bu/ac	lb/bu	in
CI 17910 ALEX	28.6	50.3	29
CI 15930 OLAF	27.4	58.1	24
ND 606 AMIDON	26.0	59.2	28
WA 6920 PENAWAWA	25.9	56.3	22
CI 17790 LEN	25.9	57.7	26
CI 17904 OWENS	25.6	55.7	27
ND 582 STOA	25.1	56.2	28
WPB 906R WESTBRED 906R	24.6	56.7	24
PI483235 GLENMAN	23.9	56.6	25
WPB 926R WESTBRED 926R	23.6	57.4	25
ND 626 GRANDIN	23.3	56.6	24
CANLANC LANCER	23.0	58.3	27
CI 13596 FORTUNA	22.8	59.3	28
C982-324 RAMBO	22.3	58.9	23
CI 17429 LEW	22.0	57.9	28
CI 17828 PONDERA	21.6	58.7	24
ND 618 GUS	21.5	57.5	23
CI 17430 NEWANA	21.2	58.7	21
NDCUT CUTLESS	20.4	59.6	23
MT 8402 MT7336/SHORTANA	17.5	55.1	23
EXPERIMENTAL MEANS	23.6	57.2	25
F TEST FOR VAR.	2.34	.86	4.45
C.V. 1: (S/MEAN)*100	12.55	6.80	7.31
C.V. 2: (S OF MEAN/MEAN)*100	7.24	3.93	4.22
LSD (0.05)	4.9	6.4	3

Grain yield based on 60 lb/bu as standard test weight.

Planting date: April 20, 1990

Growing season precipitation (April-July): in.

Fertilizer: 40-30-0, 60 lbs/ac of 11-53-0 with seed, 40 lbs of N/ac as anhydrous ammonia incorporated prior to seeding.

Previous crop: Fallow

TABLE 8. OFF-STATION TRITICALE VARIETY TEST - MOCCASIN
Central Ag. Research Center, Moccasin, MT 1990

VARIETY	GRAIN YIELD	TEST WT.	PLANT HT.	HEADING DATE
	lb/ac	lb/bu	in	
TRITOT44 WAPITI	1472.67	50.57	31.15	181.00
TRITOSUN SUNLAND	1390.00	53.57	28.67	181.00
CI 17430 NEWANA	1270.67	58.23	21.64	182.00
TRITMARV MARVAL	1216.00	44.40	33.50	181.00
TRITJUAN JUAN	1182.67	50.57	30.24	182.00
TRITWELS WELSH	1175.33	49.47	31.54	181.00
TRITBEAG BEAGLE 82	1171.33	49.93	30.37	181.00
TRITKRAM KRAMER	1170.67	48.10	30.11	179.33
TRITKARL KARL	1153.33	47.10	23.98	179.33
TRITCARM CARMAN	1128.67	49.13	32.06	180.67
EXPERIMENTAL MEANS	1233.13	50.11	29.33	180.83
F TEST FOR VAR.	.63	129.43	7.84	28.91
C.V. 1: (S/MEAN)*100	19.99	1.13	7.82	.16
C.V. 2: (S OF MEAN/MEAN)*100	11.54	.65	4.52	.09
LSD (0.05)	NS	.98	3.94	.50

Planting date: April 18, 1990

Growing season precipitation (April-July): 6.24 in.

Fertilizer: 66-30-0, 60 lbs/ac of 11-53-0 with seed, 60 lbs of N/ac as urea broadcast and incorporated prior to seeding.

Previous crop: Fallow

TABLE 9. OFF-STATION TRITICALE VARIETY TEST - HIGHWOOD
Central Ag. Research Center, Moccasin, MT 1990

VARIETY	GRAIN YIELD	TEST WT.	PLANT HT.
	lb/ac	lb/bu	in
CI 17430 NEWANA	2603	60.3	28
TRITKRAM KRAMER	2374	47.2	31
TRITKARL KARL	2045	48.7	27
TRITOSUN SUNLAND	2023	46.8	32
TRITOT44 WAPITI	1928	45.9	35
TRITMARV MARVAL	1806	42.8	38
TRITCARM CARMAN	1708	45.5	35
TRITJUAN JUAN	1629	43.0	31
TRITWELS WELSH	1550	45.0	36
TRITBEAG BEAGLE 82	1424	43.9	34
EXPERIMENTAL MEANS	1909	46.9	
F TEST FOR VAR.	17.85	75.71	
C.V. 1: (S/MEAN)*100	7.92	2.15	
C.V. 2: (S OF MEAN/MEAN)*100	4.57	1.24	
LSD (0.05)	259	1.7	

Planting date: April 25, 1990

Fertilizer: 80-30-0, 60 lbs/ac of 11-53-0 with seed, 80 lbs of N/ac as anhydrous ammonia incorporated prior to seeding.

Previous crop: Spring wheat

TABLE 10. OFFSTATION TRITICALE VARIETY TEST - DENTON
Central Ag. Research Center, Moccasin, MT 1990

VARIETY	GRAIN YIELD	TEST WT.	PLANT HT.
	lb/ac	lb/bu	in
TRITKRAM KRAMER	1725	46.5	30
TRITKARL KARL	1701	47.3	26
CI 17430 NEWANA	1448	58.2	22
TRITOSUN SUNLAND	1388	52.7	30
TRITJUAN JUAN	1322	48.6	33
TRITWELS WELSH	1218	48.1	33
TRITOT44 WAPITI	1181	47.6	32
TRITBEAG BEAGLE 82	1173	48.5	32
TRITCARM CARMAN	1161	48.0	31
TRITMARV MARVAL	1006	41.8	33
EXPERIMENTAL MEANS	1332	48.7	30
F TEST FOR VAR.	6.03	45.28	12.37
C.V. 1: (S/MEAN)*100	12.52	2.25	6.05
C.V. 2: (S OF MEAN/MEAN)*100	7.23	1.30	3.49
LSD (0.05)	286.07	1.88	3.12

Planting date: April 20, 1990

Fertilizer: 40-30-0, 60 lbs/ac of 11-53-0 with seed, 40 lbs of N/ac as
anhydrous ammonia incorporated prior to seeding.

Previous crop: Fallow

TABLE 11. OFF-STATION SPRING BARLEY VARIETY TRIAL - MOCCASIN
Central Ag. Research Center, Moccasin, MT 1990.

VARIETY	GRAIN YIELD	TEST WT.	PLANT HT.	HEADING DATE	PLUMP	THINS	PAN
	bu/ac	lb/bu	in		%	%	%
MT140523 Hector/Klages	37.9	45.6	27	180	10	62	29
ND 9866 ND 7014/ Bowm	34.6	48.6	29	177	25	25	50
PI491534 Gallatin	33.9	46.5	25	179	13	44	43
PI531228 Bearpaw	33.8	45.2	25	183	26	29	45
CI 15856 Lewis	33.7	47.4	27	180	16	41	43
CI 15229 Steptoe	33.0	39.1	27	178	10	41	49
CI 15857 Clark	32.4	44.8	26	182	7	65	28
CI 15514 Hector	31.1	46.0	26	181	11	47	42
CI 9558 Piroline	30.5	46.3	25	179	5	67	28
PI483237 Bowman	28.6	47.2	28	177	26	20	54
78Ab6871 Crystal	28.2	47.1	23	184	24	26	50
SK 76333 Harrington	24.8	47.0	25	180	34	19	47
EXPERIMENTAL MEANS	31.9	45.9	26	180	17	41	42
F TEST FOR VAR.	3.71	29.36	3.65	21.96	5.27	16.90	4.29
C.V. 1:	9.87	1.65	5.32	.46	41.05	17.92	18.21
C.V. 2:	5.70	.95	3.07	.27	23.70	10.34	10.51
LSD (0.05)	5.3	1.3	2	1	12	12	13

Grain yield based on 48 lb/bu as standard test weight.

Planting date: April 18, 1990

Growing season precipitation (April-July): 6.24 in.

Fertilizer: 66-30-0, 60 lbs/ac of 11-53-0 with seed, 60 lbs of N/ac as urea broadcast and incorporated prior to seeding.

Previous crop: Fallow

TABLE 12. OFF-STATION SPRING BARLEY NURSERY - HIGHWOOD
Central Ag. Research Center, Moccasin, MT 1990

VARIETY	GRAIN YIELD	TEST WT.	PLANT HT.	PLUMP	THINS	PAN
	bu/ac	lb/bu	in	%	%	%
SK 76333 Harrington	68.3	50.1	27	73	9	18
CI 15514 Hector	64.7	51.7	28	68	13	19
CI 9558 Pirolina	64.3	52.6	29	72	9	19
PI531228 Bearpaw	62.1	49.7	28	72	9	15
PI491534 Gallatin	61.7	51.5	26	69	11	19
CI 15857 Clark	59.3	50.3	28	74	9	17
MT140523 Hector/Klages	58.2	50.6	28	65	15	19
78Ab6871 Crystal	57.5	51.2	28	67	12	18
PI483237 Bowman	56.7	51.1	27	79	8	14
CI 15856 Lewis	55.0	51.9	27	71	12	14
ND 9866 ND 7014/ Bowman	54.8	52.1	27	78	8	14
CI 15229 Steptoe	43.4	45.7	27	74	13	13
EXPERIMENTAL MEANS	58.8	50.7		72	11	17
F TEST FOR VAR.	6.67	27.28		1.73	2.29	1.18
C.V. 1: (S/MEAN)*100	7.27	1.17		7.65	25.93	24.43
C.V. 2: (S OF MEAN/MEAN)*100	4.20	.68		4.42	14.97	14.10
LSD (0.05)	7.3	1.0		9	5	7

Grain yield based on 48 lb/bu as standard test weight.

Planting date: April 25, 1990

Fertilizer: 80-30-0, 60 lbs/ac of 11-53-0 with seed, 80 lbs of N/ac as anhydrous ammonia incorporated prior to seeding.

Previous crop: Spring wheat

139

TABLE 13. OFF-STATION SPRING BARLEY VARIETY TRIAL - DENTON
Central Ag. Research Center, Moccasin, MT 1990

VARIETY	GRAIN YIELD	TEST WT.	PLANT HT.	PLUMP	THINS
	bu/ac	lb/bu	in	%	%
ND 9866 ND 7014/ Bowm	49.1	48.7	27	55	12
CI 15856 Lewis	46.5	45.5	24	24	31
CI 15229 Steptoe	44.2	38.7	25	41	17
CI 9558 Piroline	43.2	45.6	24	16	44
PI483237 Bowman	42.4	47.7	27	61	8
PI491534 Gallatin	42.3	45.1	24	26	27
MT140523 Hector/Klages	40.9	44.2	25	16	50
PI531228 Bearpaw	39.0	42.4	24	35	24
CI 15514 Hector	38.3	44.8	25	16	49
CI 15857 Clark	38.2	44.3	24	20	40
SK 76333 Harrington	37.4	44.8	25	53	10
78Ab6871 Crystal	27.5	46.0	23	36	17
EXPERIMENTAL MEANS	40.8	44.8	25	33	27
F TEST FOR VAR.	1.76	9.38	1.40	6.58	5.12
C.V. 1:	17.44	3.18	7.40	33.28	42.39
C.V. 2:	10.07	1.84	4.27	19.21	24.48
LSD (0.05)	NS	2.41	3.11	18.78	19.68

Grain yield based on 48 lb/bu as standard test weight.

Planting date: April 20, 1990

Fertilizer: 40-30-0, 60 lbs/ac of 11-53-0 with seed, 40 lbs of N/ac as
anhydrous ammonia incorporated prior to seeding.

Previous crop: Fallow