PROJECT TITLE: Evaluation of winter wheat variety performance in off-station trials at Denton, Highwood, Moore, and Winifred.

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

RESULTS:
The Denton, Moore, and Winifred trials were planted on fallow and Highwood was recropped no-till following barley. Winter wheat yields at Denton, Moore, and Highwood were below average, and near average at Winifred.

Denton: Yields ranged from 53 to 30 bu/a, with Promontory producing the highest yield. Test weights averaged 59.8 lbs/bu, while proteins averaged 14.4%. Data for the Denton site are presented in Tables 1 & 2.

Highwood: Yields ranged from 50 to 32 bu/a, with Weston producing the highest yield. Test weights averaged 60.6 lbs/bu, while proteins averaged 11.3%. Data for the Highwood site are presented in Tables 3 & 4.

Moore: Yields ranged from 46 to 20 bu/a, with QT 542 producing the highest yield. Test weights averaged 57.4 lbs/bu, while proteins averaged 14.7%. Data for the Moore site are presented in Tables 5 & 6.

Winifred: Yields ranged from 57 to 36 bu/a, with Tiber producing the high yield. Test weights averaged 59.1 lbs/bu, while proteins averaged 14.1%. Data for the Winifred site are presented in Tables 7 & 8.

SUMMARY:
Promontory and Weston had over all good performance which may be a reflection of the varieties' tolerance to cold, wet conditions experienced through the spring of 1996.
Denton: Judith has the high average yield (53 bu/a) over 8 yr, followed by Neeley (51 bu/a). Over 6 seasons, Hybritech 542 has averaged 5 bu/a more than Neeley, and 3 bu/a more than Judith.

Highwood: Neeley has the high average yield over 8 yr (59 bu/a). Over 6 comparable yr, Hybritech 542 has an ave yield of 63 bu/a and Neeley has a 62 bu/a ave.

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Moore: Neeley has the high 10 yr ave yield (45 bu/a), followed by Tiber and Judith. Hybritech 542 and NuWest have a 4 and 2 bu/a, respectively, advantage over Neeley in comparable years.

Winifred: With only 3 yr data, Hybritech has the high ave yield (54 bu/a).

FUTURE PLANS:
Winter wheat variety evaluations will continue at Denton, Highwood/Fort Benton, Moore, and Winifred.

Table 1 1996 Denton Winter Wheat Variety Performance Trial
Exp. 3871 Central Agricultural Research Center, Moccasin, MT.

Variety	Dockage *	Plant Ht.	Grain Yield	Test Wt.	Protein Content
	%	"	bu/a	lbs/bu	%
PROMONTORY	3.00	26	52.7	59.6	13.4
QT 542	2.00	32	48.1	59.4	13.9
MANNING	2.37	26	47.3	58.3	13.9
ROCKY	1.27	36	45.9	60.8	13.9
BIGHORN	1.67	25	45.7	60.8	14.5
MT 91192	1.37	27	45.5	57.8	14.2
JUDITH	1.97	28	45.3	57.3	14.5
NEELEY	1.50	27	44.5	59.5	14.1
KESTREL	1.60	31	44.4	59.5	13.6
CENTURK	1.57	30	44.3	59.8	14.2
WESTON	1.87	34	44.1	60.6	14.4
YUMA	2.03	25	43.4	58.7	13.2
NUWEST	1.27	29	43.4	60.3	14.6
MT 9222	1.80	31	43.0	59.9	14.6
ERHARDT	1.67	29	42.4	61.6	15.0
MCGUIRE	3.43	28	42.4	58.9	15.6
TIBER	1.83	32	42.0	60.3	14.8
AC READYMADE	1.27	30	42.0	61.5	15.0
VANGUARD	1.60	29	40.7	59.5	14.6
REDWIN	1.33	29	39.7	60.6	15.2
RAMPART	1.60	32	39.6	59.4	15.0
AGASSIZ	1.87	36	37.6	60.6	14.7
NORSTAR	2.37	36	35.0	60.9	14.5
HAWK	2.53	29	30.1	59.2	13.4
EXPERIMENTAL MEANS	1.87		42.88	59.79	14.37
F TEST FOR VAR. df=46	13.14		5.04	10.39	8.95
C.V. 1: (S/MEAN)*100	14.00		8.08	.97	2.44
LSD (0.05)	.43		5.69	.96	.58

*Dockage = % clean out after yield analysis. Dockage test was conducted to see if there was any difference in threshability.
Planted: 9-27-96 on fallow ground.
Previous Crop: spring wheat
Harvested: 8-6-1995
Fertilizer: 65 units N preplant and 50# 18-46-0 w/seed.
Growing Season Precipitation (April-July): 5.16"

April	May	June	July
0.72"	3.02"	1.37"	0.05"

Producer: Richard Barber, Denton.

Table 2 Denton Off-Station Winter Wheat Multi-Year Summary
Central Agricultural Research Center, Moccasin MT.

Variety	1988	1989	1990	1991	1992	1993	1995	1996	Ave.	Neeley Same Yrs
	bu/a									
CENTURK	24	53	48	59	25	55	74	44	48	51
NORSTAR	11	59	44	39	24	55	51*	35	40	51
NEELEY	20	52	55	64	24	66	82	44	51	--
ROCKY	26	67	50	60	22	57	73	46	50	51
TIBER	20	59	52	55	28	65	73	42	49	51
JUDITH	27	64	59	61	26	55	87	45	53	51
HYBRITECH 542		71	57		40	59	78	48	59	54
BIGHORN			48	60#	23	56	73	46	51	56
HAWK				62	17	50	77	30	47	56
AGASSIZ				46	15	51	61	38	42	56
NUWEST			50	54			67	43	53	61
KESTREL						60	80	44	61	64
AC READYMADE						53	60	46	53	64
ERHARDT							71	42	56	63
VANGUARD							56	41	48	63
RAMPART							76	40	58	63
McGUIRE							71	42	56	63
Mean	20.5	55.3	49.0	53.2	22.2	56.0	73.1	42.9		

#Bighorn was planted on one end (not randomized).
1994 trial was abandoned due to variable stands resulting from wind damage.
*Suspected low germination resulted in low yields.
Trials were located on Richard Barber farm, Denton, MT.

Table 3 1996 Highwood Winter Wheat Variety Performance Trial
Exp. 3872 Central Agricultural Research Center, Moccasin, MT.

Variety	Plant Ht.	Grain Yield	Test Wt.	Protein Content
	"	bu/a	lbs/bu	%
WESTON	30	50.2	62.5	10.8
PROMONTORY	28	49.2	62.0	11.0
NEELEY	32	47.2	60.8	10.5
MT 91192	26	45.8	59.1	11.0
TIBER	34	45.6	61.8	10.9
YUMA	26	45.0	60.5	10.4
QT 542	26	44.9	60.3	10.6
KESTREL	32	43.3	58.4	10.7
ROCKY	28	42.3	61.3	10.8
REDWIN	29	41.4	61.1	11.6
VANGUARD	27	39.8	60.4	11.8
RAMPART	25	39.5	60.3	11.8
AC READYMADE	28	39.2	61.7	11.5
CENTURK'	26	38.5	60.5	11.4
MT 9222	27	37.5	60.0	11.1
MANNING	26	37.1	60.3	11.7
JUDITH	26	36.4	59.5	11.7
NUWEST	29	36.4	60.7	11.3
ERHARDT	25	34.9	60.9	12.0
BIGHORN	26	34.2	60.5	11.7
MCGUIRE	28	34.1	60.2	12.6
HAWK	23	33.5	60.2	12.1
NORSTAR	37	32.5	60.7	10.8
AGASSIZ	30	32.4	60.7	11.4
TOMAHAWK*		46.2	60.4	10.8
EXPERIMENTAL MEANS		40.04	60.59	11.31
F TEST FOR VAR. df=46		6.87	5.69	8.76
C.V. 1: (S/MEAN)*100		8.88	1.07	3.01
LSD (0.05)		5.85	1.07	.56

*Tomahawk was planted on one end (not randomized).
Planted: 10-10-95 no-till into barley stubble.
Harvested: 8-6-96
Fertilizer: 60# 18-46-0 w/seed
Producer: Ron Long, Shonkin.

Table 4 Highwood Off-Station Winter Wheat Multi-Year Summary
Central Agricultural Research Center, Moccasin, MT.

Variety	1988	1989	1990	1991	1993	1994	1995	1996	Ave.	Neeley Same Yrs
	bu/a									
CENTURK	20	68	55	66	50	45	66	38	51	59
NORSTAR	21	74	53	55	49	43	56*	32	48	59
NEELEY	26	83	64	74	58	50	69	47	59	--
ROCKY	21	75	56	68	51	44	63	42	52	59
TIBER	24	76	59	66	56	47	74	46	56	59
JUDITH	24	70	67	63	39	44	70	36	52	59
HYBRITECH542		81	70		54	52	78	45	63	62
BIGHORN			59	66#	55	43	70	34	54	60
HAWK				66	53	42	59	33	51	60
AGASSIZ				57	48	40	62	32	48	60
NUWEST			58	63		41	66	36	53	61
KESTREL					58	44	70	43	54	56
AC READYMADE					51	43	74	39	52	56
ERHARDT						44	72	35	50	55
VANGUARD						40	68*	40	49	55
RAMPART						45	77	39	54	55
McGUIRE							59	34	46	58
Mean	21.3	70.9	58.1	62.1	51.3	44.5	68.7	40.0		

#Bighorn was planted on one end (not randomized).
1992 Highwood Trial was abandoned due to volunteer barley infestation.
*Suspected low germination resulted in low yields.
1995 trial had a high incidence of volunteer spring wheat.
Trials were located on the Ron Long farm, Shonkin, MT.

Table 5 1996 Moore Winter Wheat Variety Performance Trial
Exp. 3873 Central Agricultural Research Center, Moccasin, MT.

Variety	Plant Ht.	Grain Yield	Test Wt.	Protein Content
	"	bu/a	lbs/bu	%
QT 542	28	46.4	56.3	14.4
ERHARDT	27	42.9	59.5	15.1
ROCKY	26	41.1	58.0	14.1
MANNING	27	41.0	55.9	14.2
AGASSIZ	32	40.7	56.6	15.1
MT 91192	24	40.6	55.6	15.0
WESTON	33	39.4	58.0	14.9
PROMONTORY	29	39.2	58.1	14.4
TIBER	29	38.7	58.9	15.0
CENTURK	27	37.7	57.2	14.3
MCGUIRE	31	37.1	56.3	15.5
REDWIN	27	36.7	59.3	15.5
NEELEY	30	36.4	57.5	14.3
KESTREL	31	36.2	55.5	14.3
AC READYMADE	26	35.5	59.2	15.4
JUDITH	27	35.0	54.3	15.3
VANGUARD	29	34.8	58.0	14.7
NORSTAR	31	34.2	58.6	15.0
NUWEST	27	33.8	57.8	15.0
BIGHORN	23	33.6	57.6	15.1
RAMPART	28	33.0	58.0	14.9
MT 9222	29	29.9	56.2	14.6
YUMA	26	27.0	57.0	13.5
HAWK	26	20.4	57.7	13.8
EXPERIMENTAL MEANS		36.31	57.38	14.73
F TEST FOR VAR. df=46		3.35	8.77	3.31
C.V. 1: (S/MEAN)*100		14.07	1.35	3.52
LSD (0.05)		8.40	1.27	.85

Planted: 9-27-96 on fallow ground.
Harvested: 8-9-1996
Fertilizer: 50# 18-46-0 w/seed, 60 units N broadcast.
Growing Season Precipitation (April-July): 6.10"

April	May	June	July
2.00"	3.00"	0.80"	0.30"

Producer: Gary Heilig, Moore.

Table 6 Moore Off-Station Winter Wheat Multi-Year Summary
Central Agricultural Research Center, Moccasin, MT.

Variety	1986	1987	1988	1989	1990 @	1991	1992	1994	1995	1996	Ave.	Neeley Same Yrs
	bu/a											
CENTURK	39	69	26	45	35	58	30	36	31	38	41	45
NORSTAR	32	71	9	47	35	49	28	37	31*	34	37	45
NEELEY	39	92	17	46	34	64	42	37	45	36	45	--
ROCKY	35	69	24	49	29	57	33	36	40	41	41	45
TIBER	39	86	20	50	33	56	41	35	43	39	44	45
JUDITH	39	78	28	49	36	56	32	34	47	35	43	45
HYBRITECH542				52	41		48	35	43	46	44	40
BIGHORN					42	58#	34	35	41	34	41	43
HAWK						62	31	35	32	20	36	45
AGASSIZ						49	35	33	42	41	40	45
NUWEST					47	55		42	46	34	45	43
KESTREL								34	41	36	37	39
AC READYMADE								35	38	35	36	39
ERHARDT								37	42	43	41	39
VANGUARD								29	29*	35	31	39
RAMPART								34	44	33	37	39
McGUIRE									41	37	39	40
Mean	36.0	70.7	20.1	46.3	36.4	54.3	35.4	35.4	40.5	36.3		

Bighorn was planted on one end (not randomized).
@ 1990 Nursery suffered aphid damage.
1993 Nursery suffered hail damage
*Suspected low germination resulted in low yields.

Table 7 1996 Winifred Winter Wheat Variety Performance Trial
Exp. 3874 Central Agricultural Research Center, Moccasin, MT.

Variety	Plant Ht.	Grain Yield	Test Wt.	Protein Content
	"	bu/a	lbs/bu	%
TIBER	38	56.6	61.1	14.0
ROCKY	36	55.3	60.5	13.4
QT 542	35	55.0	58.0	13.8
CENTURK	37	54.8	59.6	13.6
MT 9222	33	54.2	58.0	14.2
PROMONTORY	33	54.1	59.8	13.7
WESTON	36	52.5	60.0	14.4
REDWIN	36	52.4	61.7	14.6
ERHARDT	31	52.3	60.9	14.6
JUDITH	35	52.1	55.8	14.6
KESTREL	35	51.7	56.9	13.9
NUWEST	38	50.5	59.6	13.9
MANNING	32	50.2	56.9	13.9
NORSTAR	40	49.9	61.0	14.0
BIGHORN	28	49.7	59.5	14.2
MT 91192	29	49.3	56.7	14.3
AC READYMADE	36	48.8	61.4	14.6
MCGUIRE	33	48.7	58.5	14.4
YUMA	30	46.7	58.6	12.8
AGASSIZ	39	46.1	59.6	14.8
VANGUARD	34	45.1	59.2	14.4
NEELEY	32	43.2	57.9	14.5
RAMPART	33	42.6	59.0	14.3
HAWK	31	36.0	58.0	13.4
TOMAHAWK*		54.0	59.2	13.2
EXPERIMENTAL MEANS		49.92	59.09	14.10
F TEST FOR VAR. df=46		5.50	31.14	10.74
C.V. 1: (S/MEAN)*100		7.11	.84	1.78
LSD (0.05)		5.83	.82	.41

*Tomahawk was planted on one end (not randomized).
Planted: 9-28-95 on fallow ground.
Harvested: 8-9-96.
Fertilizer: 50# 18-46-0 w/seed, 60 units N broadcast.
Growing Season Precipitation (April-July): 6.54"

April	May	June	July
0.59"	3.25"	2.01"	0.69"

Producer: Bruce Udelhoven and Tom Econom, Winifred.

Table 8 Winifred Off-Station Winter Wheat Multi-Year Summary
Central Agricultural Research Center, Moccasin, MT.

Variety	1992	1994	1996	Ave.
		bu/a		
CENTURK	31	53	55	46
NORSTAR	30	50	50	43
NEELEY	40	52	43	45
ROCKY	32	50	55	46
TIBER	36	47	57	47
JUDITH	30	51	52	44
HYBRITECH 542	47	59	55	54
BIGHORN	31	53	50	45
HAWK	25	55	36	39
AGASSIZ	30	42	46	39
NUWEST		49	50	49
KESTREL		54	52	53
AC READYMADE		53	49	51
ERHARDT		52	52	52
VANGUARD		44	45	44
RAMPART		49	43	46
McGUIRE			49	49

The 1993 and 1995 trials were not harvested due to hail damage.