

PROJECT TITLE: Evaluate winter wheat variety performance under standard cropping methods at Denton, Highwood, Winifred and Moore.

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Objectives:
To evaluate the performance of winter wheat varieties in environments and cropping methods unlike those at the Central Agricultural Research Center.

RESULTS:
Yields and test weights were generally below average due to a combination of Russian wheat aphid damage and spring moisture stress. Protein contents were much higher than long term average. High yielding varieties across the locations were Quantum 542, Neeley, Blizzard, Tiber, Redwin, and Warrior.

The Highwood site, the only one planted on continuous crop, was abandoned due to severe infestation of volunteer barley. It was planted September 12. The Denton location suffered both drought and Russian wheat aphid damage causing quite a bit of variability in the nursery. There was a 27 bu/a yield range with in the nursery. The aphids were not treated because of the poor spring moisture conditions. The Moore location had near average yield levels. Russian aphids were treated in mid-May. It had been a few years since a nursery was established in the Winifred area. The Winifred trial had a 22 bu/a yield range between the high and low yielding varieties. The high yields were near the long term average. An additional site was established near Winnett. At Winnett, yields and test weights were near expectations. Early maturing varieties had some shatter damage due to hail. Some varieties had reduced stands. It was not determined if it was due to winter kill. The Russian aphids were treated in May.

SUMMARY:
Varieties with high yield performance over five years at Denton are Neeley, Judith, Tiber, Rocky, and Warrior. Varieties with high seven year average yields at Moore are Neeley, Winridge, Tiber, Judith, Centurk, and Warrior. Quantum 542 has consistently performed well in the central Montana trials.

FUTURE PLANS:
Winter wheat variety off-station trials are to be continued at Denton, Highwood, Moore, and Winifred.

Table 1 1992 Denton Winter Wheat Variety Performance Summary
 Exp.3871 Central Agricultural Research Center, Moccasin, Montana

Mc

ID#	Variety	Height	Yield	Testwt
		"	bu/a	lbs/bu
QT 542	HYBRITECH 542	26	39.83	60.0
CI 13190	WARRIOR	26	30.60	60.0
PI517194	TIBER	22	27.77	59.8
ID 279	BLIZZARD	25	26.73	61.6
MT 8039	JUDITH	20	26.13	58.2
CI 17727	WESTON	25	26.00	59.4
CI 15075	CENTURK	22	25.17	59.4
NA 0001	THUNDERBIRD	22	25.03	59.4
CI 8885	CHEYENNE	20	24.73	60.0
CI 17860	NEELEY	22	23.87	58.2
CI 17735	NORSTAR	26	23.77	57.8
CI 13670	WINALTA	23	23.63	58.6
CI 17844	REDWIN	27	23.30	58.6
RH78W296	BIGHORN	22	23.00	57.8
CI 17879	ROCKY	23	21.53	59.2
PI491532	CREE	25	21.47	61.0
CI 17902	WINRIDGE	22	21.00	59.2
CI 17940	ARCHER	21	20.23	56.8
PI477287	RAM	22	18.80	57.2
CI 17846	MANNING	22	17.40	58.6
CI 17439	ROUGH RIDER	23	17.20	58.4
CI 17952	HAWK	19	16.53	59.8
PI478771	AGASSIZ	24	14.67	56.8
PI491533	NORWIN	15	13.83	55.6
PI518591	ARAPAHO	21	13.13	55.2
ND 8002	SEWARD	20	12.50	55.8
EXPERIMENTAL MEANS			22.23	
F TEST FOR VAR. (df 50)			2.90	
C.V. 1: (S/MEAN)*100			27.42	
C.V. 2: (S OF MEAN/MEAN)*100			15.83	
LSD (0.05)			10.00	

Planted: 9-18-1992 Fertilizer: 50 lbs 18-46-0 w/seed
 Harvested: 7-30-92 50 lbs N preplant Anhydrous
 Soil moisture at planting: adequate to good.

Growing conditions: Generally poor due high temperatures and low precipitation levels in mid-spring coupled with high Russian wheat aphid populations. The stressful growing conditions resulted in a high degree of variability with in the plot area.

Table 2 1992 Moore Winter Wheat Variety Performance Summary. Mc
Exp.3873 Central Agricultural Research Center, Moccasin, Montana

ID#	Variety	Height	Yield	Testwt
		"	bu/a	lbs/bu
QT 542	HYBRITECH	25	47.63	62.07
ID 279	BLIZZARD	27	44.03	62.27
CI 17860	NEELEY	22	42.27	60.93
CI 17846	MANNING	29	41.97	62.00
CI 13190	WARRIOR	32	41.90	62.07
PI517194	TIBER	25	41.30	62.67
CI 17844	REDWIN	24	40.80	61.93
PI491532	CREE	25	39.87	62.40
CI 8885	CHEYENNE	24	39.80	61.80
ND 8002	SEWARD	29	38.67	60.67
CI 17902	WINRIDGE	25	37.60	62.13
NA 0001	THUNDERBIRD	25	37.47	61.93
CI 17439	ROUGH RIDER	30	37.23	62.07
PI478771	AGASSIZ	34	35.17	61.53
CI 17727	WESTON	29	34.40	61.60
RH78W296	BIGHORN	21	33.57	60.27
CI 17879	ROCKY	22	32.97	60.87
MT 8039	JUDITH	24	31.77	59.67
CI 17940	ARCHER	23	31.70	60.47
CI 13670	WINALTA	25	31.07	61.20
CI 17952	HAWK	24	30.80	61.20
CI 15075	CENTURK	22	29.73	61.13
CI 17735	NORSTAR	26	28.03	60.60
PI491533	NORWIN	16	27.30	60.27
PI477287	RAM	24	22.03	59.67
PI518591	ARAPAHO	25	21.13	58.33
EXPERIMENTAL MEANS			35.39	61.22
F TEST FOR VAR. (df 50)			19.26	16.81
C.V. 1: (S/MEAN)*100			7.38	.71
C.V. 2: (S OF MEAN/MEAN)*100			4.26	.41
LSD (0.05)			4.28	.71

Planted: 9-13-91 Fertilizer: 50lbs 18-46-0 with seed.
Harvested: 8-5-92 50lbs N broadcast urea.

Soil moist at seeding. Mid-spring conditions dry and hot.
The site was treated for Russian wheat aphids in mid-May.

Table 3 Denton Off-Station Winter Wheat Multi-Year Summary
Central Agricultural Research Center, Moccasin MT.

Variety	1988	1989	1990	1991	1992	Ave.
	-----bu/ac-----					
WARRIOR	24	64	45	56	31	44
WINALTA	15	55	40	43	24	35
CENTURK	24	53	48	59	25	42
NORSTAR	11	59	44	39	24	35
REDWIN	21	62	50	50	23	41
NEELEY	20	52	55	64	24	43
ROCKY	26	67	50	60	22	45
WINRIDGE	15	59	46	60	21	40
TIBER	20	59	52	55	28	43
JUDITH	27	64	59	61	26	47
CREE	23	56	47	49	21	39
NORWIN	15	64	47	52	14	38
HYBRITECH 542		71	57		40	
BIGHORN			48	60#	23	
HAWK				62	17	
BLIZZARD				51	27	
SEWARD				49	12	
AGASSIZ				46	15	

Table 3a Moore Off-Station Winter Wheat Multi-Year Summary
Central Agricultural Research Center, Moccasin MT.

Variety	1986	1987	1988	1989	1990*	1991	1992	Ave.
	-----bu/ac-----							
WARRIOR	34	62	23	48	37	56	42	43
WINALTA	35	62	21	43	35	44	31	39
CENTURK	39	69	26	45	35	58	30	43
NORSTAR	32	71	9	47	35	49	28	39
REDWIN	31	75	19	43	37	50	41	42
NEELEY	39	92	17	46	34	64	42	48
ROCKY	35	69	24	49	29	57	33	42
WINRIDGE	46	86	14	54	41	57	38	48
TIBER	39	86	20	50	33	56	41	46
JUDITH	39	78	28	49	36	56	32	45
CREE	36	66	17	46	33	51	40	41
NORWIN	33	64	15	41	30	55	27	38
HYBRITECH542				52	41		48	
BIGHORN					42	58#	34	
HAWK						62	31	
BLIZZARD						51	44	
SEWARD						59	39	
AGASSIZ						49	35	

Bighorn was planted on one end (not randomized).

* 1990 Nursery suffered aphid damage.

Table 4 1992 Winifred Winter Wheat Variety Performance Summary. Exp.3874 Central Agricultural Research Center, Moccasin, Montana. Mc

ID#	Variety	Survival	Height	Yield	Testwt
		f	"	bu/a	lbs/bu
QT 542	HYBRITECH	3.00	25	46.63	60.40
CI 17860	NEELEY	3.00	20	40.17	59.87
CI 17844	REDWIN	3.00	23	38.37	61.47
CI 8885	CHEYENNE	3.00	24	37.73	61.40
PI491532	CREE	3.00	22	37.03	61.00
PI517194	TIBER	3.00	22	36.13	60.00
CI 13190	WARRIOR	3.00	20	33.67	59.60
CI 17439	ROUGH RIDER	3.00	35	32.57	60.40
CI 17879	ROCKY	2.33	20	31.80	58.60
CI 17727	WESTON	1.67	27	31.70	61.60
RH78W296	BIGHORN	2.67	18	31.17	58.67
ID 279	BLIZZARD	2.33	20	31.10	61.20
PI518591	ARAPAHO	3.00	21	31.00	58.53
ND 8002	SEWARD	3.00	29	30.57	58.53
CI 15075	CENTURK	3.00	19	30.57	58.93
CI 17735	NORSTAR	3.00	25	30.20	60.40
MT 8039	JUDITH	3.00	24	29.63	57.87
PI478771	AGASSIZ	3.00	27	29.53	59.87
CI 17902	WINRIDGE	2.67	26	29.23	60.33
CI 17940	ARCHER	3.00	19	29.17	58.93
NA 0001	THUNDERBIRD	2.67	23	27.20	59.13
CI 13670	WINALTA	3.00	23	26.43	59.67
CI 17846	MANNING	1.67	22	25.47	60.47
PI491533	NORWIN	3.00	20	25.37	59.33
CI 17952	HAWK	2.67	20	25.07	59.20
PI477287	RAM	2.67	20	24.13	58.20
EXPERIMENTAL MEANS		2.78		31.60	59.75
F TEST FOR VAR. (df 50)		3.55		2.70	3.52
C.V. 1: (S/MEAN)*100		12.82		17.43	1.65
C.V. 2: (S OF MEAN/MEAN)*100		7.40		10.06	.95
LSD (0.05)		.58		9.03	1.62

f = 3- 100% survival 0- all plants died.
 Planted: 9-16-1991 Fertilizer: 50 lbs 18-46-0 with seed.
 54 lbs N annhydrous amm.

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Table 6 1992 Winnett Winter Wheat Variety Performance Summary
 Exp.3875 Central Agricultural Research Center, Moccasin, Montana

ID#	Variety	Height	Yield	Testwt	Stand
		"	bu/a	lbs/bu	@
ID 279	BLIZZARD	28	49.77	60.33	2.67
CI 17860	NEELEY	22	48.90	60.17	3.00
PI517194	TIBER	26	45.63	60.07	3.00
ND 8002	SEWARD	22	45.43	59.63	3.00
CI 17735	NORSTAR	29	43.54	60.83	3.00
CI 17844	REDWIN	25	42.81	59.23	3.00
PI491532	CREE	26	42.13	61.07	3.00
PI491533	NORWIN	16	38.70	60.37	3.00
CI 8885	CHEYENNE	25	38.13	60.70	3.00
CI 13190	WARRIOR	26	37.95	60.30	2.67
PI478771	AGASSIZ	32	37.65	60.03	2.33
QT 542	HYBRITECH	24	37.51	60.77	2.67
PI477287	RAM	26	36.85	60.33	2.67
CI 17902	WINRIDGE	28	36.74	59.63	2.33
MT 8039	JUDITH	24	36.10	58.23	3.00
CI 17879	ROCKY	23	35.79	61.03	3.00
CI 13670	WINALTA	25	35.33	60.23	3.00
CI 17439	ROUGH RIDER	25	34.70	60.20	3.00
RH78W296	BIGHORN	20	33.57	59.83	3.00
CI 15075	CENTURK	25	32.57	60.50	2.33
PI518591	ARAPAHO	22	31.80	58.47	3.00
CI 17727	WESTON	33	31.35	59.73	2.00
CI 17940	ARCHER	23	28.10	58.97	2.67
NA 0001	THUNDERBIRD	24	25.73	59.93	3.00
CI 17846	MANNING	25	25.60	60.23	1.67
CI 17952	HAWK	19	24.55	61.33	3.00
EXPERIMENTAL MEANS			36.80	60.08	2.77
F TEST FOR VAR. df=50			4.79	6.68	3.94
C.V. 1: (S/MEAN)*100			14.58	.83	11.42
C.V. 2: (S OF MEAN/MEAN)*100			8.42	.48	6.59
LSD (0.05)			8.80	.82	.52

@ 0 - no stand 3 - 100 % stand

Planted: 9-13-1991 Fertilizer: 50lbs 18-46-0 W/seed
 Harvested: 8-19-1992
 Nursery was treated for Russian wheat aphids.

Table 7 #2 1992 Winnett Winter Wheat Variety Performance Summary
 Exp.38752 Central Agricultural Research Center, Moccasin, Montana

Variety	Height "	Yield bu/a	Testwt lbs/bu	Stand [@] 0 - 3
TIBER	26	51.80	60.35	3.00
ABILENE	19	30.00	59.85	2.00
SIOUXLAND	25	35.90	58.65	2.50
SIOUXLAND 89	26	31.40	57.80	2.50
REDLAND	23	30.50	59.00	2.50
ARAPAHOE	22	30.20	58.25	3.00
LAMAR	25	28.85	61.10	2.00
TAM 107	20	21.75	57.05	2.00
EXPERIMENTAL MEANS	23.25	32.55	59.01	2.44
F TEST FOR VAR. df = 7		17.70	3.91	1.70
C.V. 1: (S/MEAN)*100		8.98	1.64	18.59
C.V. 2: (S OF MEAN/MEAN)*100		6.35	1.16	13.15
LSD (0.05)		6.91	2.29	1.07

[@] 0 - no stand 3 - 100 % stand

Only the seed of Tiber was treated with a fungicide preplant.
 Planted: 9-13-1991 Fertilizer: 50lbs 18-46-0 W/seed
 Harvested: 8-19-1992

Early maturing varieties, Archer and Thunderbird, had experience severe shattering. Nursery was treated for Russian wheat aphids. Only two reps harvested because of severe kochia infestation in third rep. The presence of a high kochia population indicated there may be a developing saline seep where the nursery was placed. Tiber's stand was not affected as the other varieties were. Therefore, Tiber was able to utilize the increased available water from the seep, as indicated by its yield.