

Title: Off-station Winter Wheat Variety investigations.

Year: 1993

Personnel: Gregory D. Kushnak, Ron Thaut, and Larry Christiaens-
Research Center; and Dr. Phil Bruckner, MSU, Bozeman.

Off-station Winter wheat variety trials were grown near Chester, Knees area west of Brady, Dutton, Sun River, and Eden during 1993. Above average rainfall resulted in high yields at Chester and Dutton, but yields at the Knees and Eden were reduced substantially by wheat streak mosaic virus and Septoria, respectively. None of the test plots were affected by sawfly or Russian wheat aphid this year.

Data for the 1993 trials are presented in Tables 1,3,5,7, and 9; with five-year averages for the respective sites in Tables 2,4,6,8, and 10. Recently developed varieties do not have enough test-years to be included in the five-year summaries, and caution should be used when considering these for production. These include Readymade and Kestrel. Readymade is a Canadian variety selected at Lethbridge from Redwin, and has shown similar agronomics to Redwin thus far. Kestrel was developed in Saskatchewan, and has shown a high level of winterhardiness.

Variety rankings by yield in the 5-year averages varied among the locations, but the top producers generally included Neeley, Tiber, Quantum 542, Rocky, and Judith.

Table 1. Dryland Winter Wheat variety trial grown near Chester, 1993. Mont. Agr. Expt. Sta., Western Triangle Ag. Research Center, Conrad, MT.

Variety	Yield bu/ac	Test wt. lbs/bu.	Plant hgt. inches	Spring survival class 1/	% protein
KESTREL	71.7	62.1	33	4-5	7.7
BLIZZARD	71.3	62.3	35	2-3	11.9
NEELEY	69.6	62.4	32	3	10.3
TIBER	68.7	62.2	34	3	10.8
WINRIDGE	64.5	61.1	33	2	9.4
AC READYMADE	64.0	62.0	33	3	11.5
SEWARD	63.4	60.6	34	4	9.2
QUANTUM 542	63.3	61.5	35	3	10.0
JUDITH	63.3	61.0	33	3	10.7
NORSTAR	63.3	62.7	38	5	9.9
REDWIN	62.5	62.6	33	3	10.8
ROCKY	62.2	61.8	33	2	10.8
BIGHORN	62.1	62.4	30	3	11.2
ARCHER	61.1	60.5	31		10.5
ARAPAHO	60.2	60.2	32		11.7
AGASSIZ	60.1	61.7	38	4	12.4
CREE	60.0	62.4	34	3	11.0
WESTON	59.7	63.0	35		12.0
WARRIOR	59.5	61.8	37		11.4
HAWK	59.2	61.9	28	2-3	10.2
WINALTA	57.3	63.1	36	4	11.2
CENTURK	57.1	61.9	32	2	10.1
MANNING	54.9	61.0	30		10.8

Cooperator: Mike Violet

Location: Ten miles southwest of Chester, Liberty County.

Fertilizer: 100# 11-52-0 with the seed, + 50# AA-N.

Previous crop: Fallow.

Date seeded: Sept. 22, 1992.

Date harvested: Aug. 19, 1993.

Rainfall: From May 14 to Aug. 19, 7.4 inches.

1/ = Spring survival class: 5=best; 1=very low; based on several location-years of observation.

Yield experimental mean: 62.54

Error degrees of freedom: 44.00

F test for var. = 4.08, C.V. 2 = 3.45, LSD (0.05) = 6.16

Table 2. Five-year summary for Winter Wheat varieties grown southwest of Chester, MT. 1987 - 1988 - 1989 - 1990 - 1993. Mont. Agr. Expt. Station, Western Triangle Ag. Research Center, Conrad, MT.

Variety	5 - year comparable average			
	Yield bu\ac	Test wt. lbs\bu.	Plant hgt. inches	% Protein
NEELEY	52.3	58.1	28.2	13.9
QUANTUM 542	51.6	57.8	30.4	13.1
TIBER	49.3	59.0	29.2	13.8
BLIZZARD	48.8	59.2	29.0	15.5
JUDITH	48.6	59.1	29.2	14.0
SEWARD	48.2	57.9	29.8	13.1
ROCKY	47.8	59.5	27.6	13.8
CENTURK	47.5	58.7	28.2	13.5
WINRIDGE	47.2	57.3	28.6	13.2
REDWIN	47.0	60.0	28.4	15.0
CREE	46.7	60.6	29.6	14.3
NORSTAR	45.1	60.2	32.0	13.6
HAWK	44.5	59.7	25.0	13.8
WARRIOR	43.9	59.0	30.6	14.5
WINALTA	43.9	62.0	30.6	14.6
AGASSIZ	42.2	59.1	32.6	15.3

Cooperator: Mike Violet.

Location: Ten miles southeast of Chester, MT. (Liberty Co.)

Table 3. Dryland Winter Wheat variety trial grown near the Knees, 1993. Mont. Agr. Expt. Sta., Western Triangle Ag. Research Center, Conrad, MT.

Variety	Yield bu/ac *	Test wt. lbs/bu *	Plant hgt. inches	Spring survival class 1/	% Protein
ROCKY	43.2	52.4	31	2	13.4
BLIZZARD	42.8	53.8	31	2-3	13.7
QUANTUM 542	38.7	51.9	30	3	12.6
HAWK	38.5	53.1	26	2-3	13.7
TIBER	34.8	53.2	29	3	12.8
SEWARD	33.8	50.0	28	4	12.1
CENTURK	33.2	50.9	30	2	13.5
ARCHER	33.1	48.8	23		14.1
BIGHORN	32.9	51.6	25	3	12.6
REDWIN	30.5	51.7	29	3	14.0
AC READYMADE	29.2	52.4	30	3	13.8
CREE	28.6	52.6	30	3	12.5
ARAPAHO	28.6	49.0	26		14.3
WARRIOR	28.4	51.4	30		13.1
NEELEY	28.2	49.2	27	3	13.0
MANNING	26.9	47.6	26		12.7
JUDITH	25.5	49.2	30	3	14.0
WINALTA	24.3	50.9	26	4	13.3
KESTREL	24.2	48.3	33	4-5	12.8
WESTON	23.7	49.2	30		13.0
NORSTAR	20.1	50.3	31	5	13.3
AGASSIZ	18.1	48.1	29	4	13.3
WINRIDGE	16.5	47.0	26	2	11.8

Cooperator: Dan Picard.

Location: Thirty miles east of Brady, Chouteau County.

Fertilizer: 100# 11-52-0 with the seed, + 65# AA-N.

Previous crop: Fallow.

Date seeded: Sept. 22, 1992.

Date harvested: Aug. 13, 1993.

Rainfall: From May 13 to Aug. 13, = 8.06 inches.

1/ = Spring survival class: 5=best; 1=very low; based on several location-years of observation.

* = Yield and test weight were reduced by wheat streak virus.

Yield experimental mean: 29.72

F test for var. = 10.57, C.V. 2 = 7.39, LSD(0.05) = 6.26.

Table 4. **Five-year summary for Winter Wheat varieties grown east of Brady, MT. near the Knees, 1987 - 1988 - 1990 - 1991 - 1993. Mont. Agr. Expt. Station, Western Triangle Ag. Research Center, Conrad, MT.**

Variety	5 - year comparable average			
	Yield bu/ac	Test wt. lbs/bu.	Plant hgt. inches	% Protein
QUANTUM 542	48.0	56.5	32.9	13.2
BLIZZARD	46.8	57.8	31.3	14.1
ROCKY	45.4	56.8	30.8	14.0
CENTURK	42.9	57.0	30.6	13.7
TIBER	42.5	59.1	31.2	14.2
CREE	40.2	59.6	32.8	14.3
JUDITH	40.2	56.4	31.4	14.7
NEELEY	39.6	56.5	29.6	13.9
SEWARD	39.5	55.3	30.0	13.5
WARRIOR	39.2	59.3	33.0	14.8
REDWIN	38.4	58.8	30.8	14.8
WINRIDGE	34.1	54.5	30.0	13.3
WINALTA	33.6	57.8	33.2	14.4
NORSTAR	31.4	56.8	35.6	14.9
AGASSIZ	31.3	54.7	33.8	14.5

Cooperator: Dan Picard.
 Location: Thirty miles east of Brady, MT. (Chouteau County)

Table 5. Dryland Winter Wheat variety trial grown near Dutton, 1993. Mont. Agr. Expt. Sta., Western Triangle Ag. Research Center, Conrad, MT.

Variety	Yield bu/ac	Test wt. lbs/bu	Plant hgt. inches	Spring survival class 1/	% protein
NEELEY	71.7	61.7	34	3	11.1
BLIZZARD	71.2	61.5	35	2-3	9.4
REDWIN	67.2	61.8	37	3	12.4
BIGHORN	65.6	61.6	31	3	11.1
ARAPAHO	64.8	60.2	29		12.1
ARCHER	64.7	60.4	34		10.8
WARRIOR	64.6	61.2	37		11.5
MANNING	62.4	60.3	34		9.4
ROCKY	60.8	61.2	35	2	11.6
QUANTUM 542	59.5	61.0	36	3	9.5
AC READYMADE	58.0	61.4	39	3	11.3
CENTURK	57.9	61.2	29	2	11.8
NORSTAR	57.6	61.7	41	5	11.7
WINRIDGE	57.3	60.5	37	2	9.6
JUDITH	56.9	60.9	37	3	11.8
KESTREL	54.3	61.4	37	4-5	8.8
WINALTA	53.4	62.4	41	4	12.5
HAWK	52.4	61.2	26	2-3	9.8
TIBER	52.0	61.5	36	3	10.6
CREE	51.0	61.6	37	3	11.4
AGASSIZ	49.8	61.1	40	4	12.4
SEWARD	48.9	60.0	38	4	10.2
WESTON	48.3	62.1	37		12.4

Cooperator: Darrell Goodmundson.

Location: Three miles east of Dutton, Teton County.

Fertilizer: 100# 11-52-0 with the seed, + 100# AA-N.

Previous crop: Fallow.

Date seeded: Sept. 22, 1992.

Date harvested: Aug. 13, 1993.

Rainfall: From May 13 to Aug. 13, 7.1 inches.

1/ = Spring survival class: 5=best; 1=very low; based on several location-years of observation.

Yield experimental mean: 58.70

Error degrees of freedom: 44.0

F test for var. = 2.01, C.V. 2 = 8.32, LSD(0.05) = 13.91

Table 6. Five-year summary for Winter Wheat varieties grown near Dutton, MT. 1988 - 1989 - 1990 - 1991 - 1993. Mont. Agr. Expt. Station, Western Triangle Agr. Research Center, Conrad, MT.

Variety	5 - year comparable average			
	Yield bu\ac	Test wt. lbs\bu.	Plant hgt. inches	% Protein
NEELEY	60.0	61.1	31.6	11.6
JUDITH	57.5	60.3	32.0	11.5
REDWIN	57.3	60.5	33.6	12.1
QUANTUM 542	57.2	60.0	33.3	10.7
ROCKY	56.7	61.7	31.6	11.2
TIBER	54.0	60.8	33.6	11.2
CREE	53.6	61.3	35.0	11.6
WARRIOR	53.6	60.9	34.2	12.9
NORSTAR	52.2	61.3	38.2	11.8
CENTURK	52.0	61.2	30.8	10.8
WINRIDGE	51.2	60.0	33.6	10.3
WINALTA	48.8	62.3	36.0	12.5

Cooperator: Darrell Goodmundson.

Location: Three miles east of Dutton, MT. (Teton County)

Table 7. Dryland Winter Wheat variety trial grown near Sun River, 1993. Mont. Agr. Expt. Sta., Western Triangle Ag. Research Center, Conrad, MT.

Variety	Yield bu/ac	Test wt. lbs/bu	Plant hgt. inches	Spring survival class 1/	% Protein
KESTREL	46.6	62.1	33	4-5	11.5
NEELEY	46.3	61.0	31	3	12.6
WESTON	45.0	63.0	33		12.5
WARRIOR	44.7	61.7	32		13.7
QUANTUM 542	44.4	62.4	30	3	11.7
ROCKY	44.2	62.8	34	2	11.8
JUDITH	42.5	60.8	35	3	13.1
REDWIN	42.5	58.6	33	3	13.8
TIBER	42.3	61.5	32	3	13.9
BIGHORN	41.7	62.4	28	2	12.8
ARCHER	41.4	61.1	27		12.3
CREE	40.6	62.3	30	3	13.7
CENTURK	40.1	62.6	31	2	13.0
ARAPAHO	39.3	61.2	31		14.4
SEWARD	38.9	61.3	33	4	12.1
AC READYMADE	38.8	61.7	35	3	14.7
WINRIDGE	38.7	62.1	33	2	12.0
WINALTA	37.1	62.8	35	4	13.8
NORSTAR	36.6	62.0	34	5	13.8
HAWK	35.5	61.9	29	2-3	12.7
AGASSIZ	35.5	59.3	33	4	13.6
MANNING	34.0	61.5	31		11.8
BLIZZARD	33.1	62.2	30	2-3	12.5

Cooperator: Chuck Merja.
Location: Two miles southeast of Sun River, Cascade county.
Fertilizer: 100# 11-52-0 with the seed + 50# AA-N.
Previous crop: Fallow.
Date seeded: Sept. 24, 1992.
Date harvested: Aug. 13, 1993.
Rainfall: From May 13 to Aug. 13, 8.03 inches.
1/ = Spring survival class: 5=best; 1=very low; based on several location-years of observation.
Yield experimental mean: 40.43
Error degrees of freedom: 44.00
F test for var. = 0.80, C.V. 2 = 10.79, LSD(0.05) = 12.44.

Table 8. **Five-year summary for Winter Wheat varieties grown near Sun River, MT. 1988 - 1989 - 1990 - 1991 - 1993. Mont. Agr. Expt. Station, Western Triangle Ag. Research Center, Conrad, MT.**

5 - year comparable average				
Variety	Yield bu\ac	Test wt. lbs\bu.	Plant hgt. inches	% Protein

QUANTUM 542	42.8	59.5	30.4	15.1
ROCKY	40.4	61.3	30.8	15.3
JUDITH	39.7	58.9	31.2	16.0
NEELEY	39.7	58.8	29.0	15.7
CENTURK	39.3	61.0	30.2	15.9
TIBER	38.9	60.8	30.6	15.6
CREE	38.2	61.4	31.4	15.9
REDWIN	38.1	60.4	29.8	16.2
WARRIOR	37.2	60.2	31.3	16.2
SEWARD	37.1	59.9	30.7	14.6
WINRIDGE	35.9	59.4	30.8	15.4
BLIZZARD	35.0	60.6	29.8	15.4
WINALTA	34.0	61.5	33.8	15.5
AGASSIZ	33.0	59.1	35.1	16.4
NORSTAR	31.6	60.5	35.4	15.8

Cooperator: Chuck Merja.

Location: Two miles southeast of Sun River, MT. (Cascade County)

Table 9. Dryland Winter Wheat variety trial grown near Eden, 1993. Mont. Agr. Expt. Sta., Western Triangle Ag. Research Center, Conrad, MT.

Variety	Yield bu/ac *	Test wt. lbs/bu *	Plant hgt. inches	Spring survival class 1/	% Protein
HAWK	31.2	56.2	33	2-3	10.9
QUANTUM 542	27.9	56.9	36	3	11.5
ARAPAHO	27.0	55.7	33		11.6
NEELEY	26.7	55.2	31	3	10.1
AC READYMADE	26.3	52.5	37	3	11.8
KESTREL	26.2	55.0	36	4-5	10.0
ARCHER	26.1	55.0	31		10.2
WESTON	25.9	57.2	38		11.6
MANNING	25.9	54.7	32		10.2
BIGHORN	25.7	55.5	30	3	11.0
ROCKY	24.6	55.7	35	2	11.0
WINRIDGE	23.5	54.2	36	2	9.54
BLIZZARD	23.5	53.9	36	2-3	10.7
WARRIOR	23.3	55.3	35		11.6
CENTURK	23.0	54.8	32	2	10.5
SEWARD	22.8	55.7	37	4	10.8
REDWIN	22.6	53.4	35	3	11.7
TIBER	22.2	55.3	35	3	10.5
JUDITH	21.5	54.8	34	3	10.1
NORSTAR	20.5	54.7	38	5	10.7
CREE	18.8	54.6	34	3	11.6
WINALTA	17.7	56.0	37	4	12.0
AGASSIZ	15.9	54.3	37	4	12.2

Cooperator: Tom Lorang.

Location: Three miles east of Eden, MT.

Fertilizer: 100# 11-52-0 with the seed, + 30# N. topdressed.

Previous crop: Fallow.

Date seeded: Sept. 23, 1992.

Date harvested: Aug. 25, 1993.

Rainfall: From May 13 to Aug. 25, = 8+ inches.

1/ = Spring survival classes: 5=best; 1=very low; based on several location-years of observation.

* = Yield and test weight were reduced by Septoria disease.

Yield experimental mean: 23.86

F test for var. = 3.39, C.V. 2 = 8.21, LSD(0.05) = 5.58

Table 10. **Five-year summary for Winter Wheat varieties grown near Eden, MT. 1988 - 1989 - 1990 - 1991 - 1993.**
 Mont. Agr. Expt. Station, Western Triangle Ag. Research Center, Conrad, MT.

Variety	5 - year comparable average			
	Yield bu\ac	Test wt. lbs\bu.	Plant hgt. inches	% Protein
QUANTUM 542	49.8	61.7	36.7	10.2
NEELEY	47.0	60.9	33.8	10.0
WINRIDGE	45.4	59.2	37.8	9.3
HAWK	43.7	61.0	33.7	10.2
JUDITH	43.2	59.3	33.6	10.4
TIBER	41.1	60.5	36.0	10.6
ROCKY	40.7	61.2	35.8	10.6
CENTURK	40.6	60.7	34.2	10.0
BLIZZARD	40.5	60.2	36.7	10.6
REDWIN	40.2	60.1	35.8	11.1
CREE	39.0	61.3	37.6	10.9
WARRIOR	39.8	61.1	36.8	11.1
SEWARD	39.7	60.7	39.8	10.8
NORSTAR	38.6	61.1	42.4	10.5
WINALTA	35.0	61.7	38.8	11.3
AGASSIZ	33.9	60.5	39.9	11.0

Cooperator: Tom Lorang.

Location: Three miles east of Eden, MT.

(Cascade Co.)