

TITLE: Off-station Spring Wheat and Triticale variety investigations.

YEAR: 1989

LOCATION: Western Triangle Agricultural Research Center, Conrad, MT.

PERSONNAL:

Project Leader : Gregory D. Kushnak

Cooperators : Luther Talbert & Sue Lanning, MSU; and  
Landowners (listed in footnotes to data tables).

Off-station dryland spring wheat variety trials were grown near Cut Bank, Oilmont, Choteau, and Sun River; and irrigated at Fairfield. Spring triticale varieties were grown at Cut Bank, Oilmont, and Choteau. All trials were grown on fallow, except Fairfield irrigated. Soil moisture was good at all locations, and growing season rainfall above normal; resulting in lush plant growth.

Data for the 1989 spring wheat tests at the various locations are presented in Tables 1a - 5a, with 3-year averages in Tables 1b - 5b. Test weights were low at all locations except Choteau; most likely a result of excessive water demand from the lush plant growth.

Sawfly damage was severe at Cut Bank, Oilmont, and Choteau. Sawfly resistant varieties in the tests included three semidwarfs Glenman, Rambo and Cutless; and four standard height varieties Lew, Fortuna, Lancer, and Amidon. Rambo and Amidon showed only partial resistance to sawfly in 1989, and also in 1988. Amidon is a recent release from North Dakota.

Among the sawfly resistant varieties, Glenman had the highest 3-year average yield at all dryland locations; and Lancer and Cutless ranked lowest (Tables 1b - 4b). Grain protein was generally inversely related to yield. The partially resistant Amidon ranked fairly high for both yield and protein at some locations. However, the level of resistance in Amidon was not considered high enough to offer protection from the sawfly infestations encountered in these trials. Weak, broken stems were observed for Amidon at the Sun River location.

Data from the triticale tests are presented in Tables 6-8. Ripening was later than Newana wheat for all triticale varieties. Kramer was the only triticale to completely ripen prior to a September 11 killing frost at the Cut Bank location; and Karl and Carman were mature, but not dry. The rest of the entries were fairly green. Thus, maturity class should be carefully considered when chosing triticale varieties; particularly in short growing season areas. Juan was considered too late for any of the test locations; and T-54, T-61, and Sunland were considered marginal.

Plant height was excessive for most triticales. The relatively early maturing varieties Kramer and Karl had the shortest straw - a combination which made these two varieties more agronomically desirable than the others. Wapiti had weak straw, and lodged easily.

Triticale yields were based on a 50-pound test weight. If direct comparisons to wheat yields are desired, the bushel-yield data should be converted to pounds per acre.

All triticale varieties suffered sawfly damage. Ergot was not detected in the test plots; but ergot has been observed in some triticale fields in the Triangle area during the previous year.

Table 1a. Spring wheat variety trial north of Cut Bank, 1989. Mont. Agr. Expt. Sta., Western Triangle Research Center, Conrad, MT.

Variety	Yield bu/a	Test wt.	Plant hgt. inches	% Protein
Owens (s. White)	44.0	55.9	27	10.6
Marshall	42.1	53.2	27	12.1
Penawawa (s. white)	41.5	58.6	26	10.1
Lew *	40.9	58.3	35	13.3
Amidon *	40.3	55.5	36	11.9
MT 8182	39.7	52.4	30	12.8
Fortuna *	39.2	60.9	35	13.5
Pondera	38.0	60.5	28	13.4
Glenman *	37.9	57.4	29	12.5
Rambo *	37.6	54.9	27	11.5
NK 751	37.2	61.0	27	12.4
MT 8402	36.9	60.1	27	13.4
Stoa	36.2	56.9	32	13.4
Alex	34.8	54.4	32	12.9
Olaf	34.6	57.0	27	11.8
Lancer *	34.2	58.6	35	13.2
Westbred 906R	34.1	57.3	27	12.8
Len	33.6	57.9	27	13.0
Cutless *	33.5	59.4	30	13.3
Newana	29.8	56.8	27	13.1

Cooperator and Location : Don Bradley, 14 miles north of Cut Bank, Glacier County.

Planting Date : May 10, 1989.

Harvest Date : September 11, 1989.

Previous Crop : Fallow

Fertilizer : 100# 11-51-0 with the seed.

Soil Moisture Probe Depth at Seeding : 24".

Rainfall, Planting to Maturity : More than 6".

\* Sawfly Resistant Varieties (Amidon and Rambo partial resistance).

Yield Experimental Mean : 37.3

Error Degrees of Freedom : 38.0

F. Test : 1.45

C.V. : 7.88

LSD (0.05) : 8.41

Table 1b. Three-year summary for spring wheat varieties grown north of Cut Bank, MT. 1987 - 1988 - 1989. Mont. Agr. Expt. Sta., Western Triangle Research Center, Conrad, MT.

Variety	3-year comparable average			
	Yield bu/a	Test wt.	Height inches	% Protein
Owens	50.6	58	28	11.4
Penawawa	49.8	60	26	10.8
Glenman	49.6	58	29	13.1
Rambo	49.0	59	27	12.9
Marshall	49.0	57	27	13.2
Amidon	47.5	57	36	12.8
Pondera	47.0	60	28	14.0
Len	47.0	59	28	13.5
NK 751	47.0	60	26	12.6
Lew	46.3	60	34	14.2
Alex	45.6	59	33	14.1
Newana	45.3	59	27	13.8
Olaf	44.1	59	27	13.2
Stoa	44.0	58	31	14.3
Fortuna	44.0	61	34	14.7
MT 8402	43.5	60	29	14.2
Westbred 906R	42.2	59	28	14.0
Cutless	41.6	60	29	14.4
Lancer	40.6	60	35	14.5

Table 2a. Dryland spring wheat variety trial east of Oilmont, 1989. Mont. Agr. Expt. Sta., Western Triangle Research Center, Conrad, MT.

Variety	Yield bu/a	Test wt.	Plant hgt. inches	% Protein
Penawawa (S. White)	26.2	55.7	26	16.5
Glenman *	25.5	54.0	28	17.8
Fortuna *	25.3	57.2	33	17.5
Amidon	24.5	56.6	29	17.8
MT 8402	23.4	56.3	27	16.0
Lew *	23.4	55.8	32	16.1
Newana	23.3	54.1	27	17.6
Len	23.3	53.6	29	17.4
NK 751	23.2	53.8	28	17.0
Alex	23.2	55.7	32	16.8
Stoa	23.0	54.8	31	18.6
Westbred 906R	22.8	55.0	27	17.3
Marshall	22.5	53.9	24	18.5
Owens	22.5	52.2	26	18.3
Pondera	22.0	54.7	29	18.8
Lancer *	21.8	55.5	31	15.7
Rambo *	21.8	55.9	26	16.9
MT 8182	21.0	52.2	27	18.1
Cutless *	20.4	57.4	27	19.4
Olaf	19.9	55.5	26	17.6

Cooperator and Location : Terry Alme, 8 miles east of Oilmont, Toole County.

Planting Date : April 18, 1989.  
Harvest Date : August 3, 1989.  
Previous Crop : Fallow  
Soil Moisture Probe at Planting : 2' 6".  
Rainfall, Planting to Harvest : 6"  
Fertilizer : 100# 11-51-0 with the seed.  
\* Sawfly resistant varieties.  
Yield Experimental Mean : 22.75  
Error Degrees of Freedom : 38.0  
F. Test : 2.11  
C.V. : 4.85  
LSD (0.05) : 3.18

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Table 2b. Two-year summary for dryland spring wheat varieties grown east of Oilmont, MT. 1988 - 1989. Mont. Agr. Expt. Sta., Western Triangle Research Center, Conrad, MT.

Variety	2-year comparable average			
	Yield bu/a	Test wt.	Plant height	% Protein
Glenman	20.8	55	23	16.8
Penawawa	20.8	59	21	16.5
Amidon	20.0	59	23	17.8
Stoa	19.8	57	25	18.0
Marshall	19.3	57	21	17.5
Len	19.3	56	24	17.0
Alex	18.7	58	27	17.4
Fortuna	18.7	58	25	17.5
Rambo	18.2	58	21	17.0
Pondera	18.2	58	23	18.6
Newana	18.2	57	21	17.9
Lancer	17.7	57	25	16.4
Owens	17.7	54	22	17.0
MT 8402	17.7	57	22	17.2
Olaf	17.2	57	21	17.6
Westbred 906R	17.2	56	22	17.7
Lew	17.2	57	25	17.0
Cutless	16.1	58	22	18.6

Table 3a. Dryland spring wheat variety trial east of Choteau, 1989. Mont. Agr. Expt. Sta., Western Triangle Research Center, Conrad, MT.

Variety	Yield bu/a	Test wt.	Plant hgt. inches	% Protein
Penawawa (s. white)	60.2	61.5	26	12.5
Owens (s. white)	60.1	60.1	31	12.6
MT 8402	55.5	62.5	28	15.4
MT 8182	53.6	58.4	31	15.0
Westbred 906R	53.4	60.5	29	13.9
Glenman *	52.9	61.2	30	14.1
Rambo *	52.6	62.2	27	14.1
Len	50.1	61.9	30	14.4
NK 751	50.1	60.9	28	13.4
Amidon *	49.7	61.0	33	16.2
Pondera	48.8	62.6	29	15.1
Lew *	48.6	63.2	38	14.9
Newana	47.6	59.8	27	15.2
Marshall	47.2	60.8	25	15.1
Lancer *	46.9	62.0	36	15.9
Fortuna *	45.1	62.5	38	15.6
Stoa	44.5	61.3	35	15.5
Cutless *	41.2	62.6	34	15.6
Alex	40.1	62.0	38	15.7
Olaf	38.1	60.6	29	15.4

Cooperator and Location : Rick Corey, northeast of Choteau, Teton County.

Planting Date : April 19, 1989.

Harvest Date : August 7, 1989.

Previous Crop : Fallow

Fertilizer : 100# 11-51-0 with the seed.

Soil Moisture Probe at Time of Seeding : 24".

Rainfall From May 16 to Harvest : 6".

\* Sawfly Resistant Varieties (Amidon and Rambo partial resistance).

Yield Experimental Mean : 49.3

Error Degrees of Freedom : 38.0

F. Test : 6.95

C.V. : 4.55

LSD (0.05) : 6.42

Table 34. Three-year summary for dryland spring wheat grown near Choteau, MT. 1987 - 1988 - 1989. Mont. Agr. Expt. Sta., Western Triangle Research Center, Conrad, MT.

Variety	3-year comparable average			
	Yield bu/a	Height inches	Test wt.	% Protein
Penawawa	48.1	24	61	12.0
MT 8402	44.7	26	63	14.9
Owens	44.6	28	60	11.5
Westbred 906R	42.4	28	61	14.2
NK 751	40.3	24	59	12.8
Amidon	40.1	30	60	15.5
Glenman	40.0	27	59	13.2
Lew	39.3	34	62	14.1
Rambo	39.3	25	60	13.4
Pondera	38.0	27	62	14.3
Len	38.0	27	61	13.5
Fortuna	37.3	33	61	14.8
Stoa	36.6	31	60	14.6
Marshall	36.0	24	60	14.0
Newana	36.0	26	59	14.3
Lancer	35.3	33	61	15.0
Alex	33.6	32	61	15.0
Cutless	32.6	30	62	15.2
Olaf	32.1	27	60	14.6

Table 4a. Dryland spring wheat variety trial south of Sun River, 1989. Mont. Agr. Expt. Sta., Western Triangle Research Center, Conrad, MT.

Variety	Yield bu/a	Test wt.	Plant hgt. inches	% Protein
Penawawa (S. White)	43.5	57.5	24	13.8
Newana	43.4	55.6	26	16.9
Owens (s. white)	41.8	53.1	28	14.5
Amidon *	41.7	56.6	32	16.8
MT 8402	41.6	56.2	27	17.9
Alex	41.4	57.1	34	17.5
Len	41.4	57.9	28	16.3
Glenman *	41.1	55.5	27	14.0
Westbred 906R	40.1	56.4	26	17.5
NK 751	39.5	58.1	24	15.6
Pondera	38.9	58.2	28	17.5
Marshall	38.9	55.3	24	18.3
Lew *	38.0	57.6	29	16.8
Stoa	37.8	58.1	30	17.2
Rambo *	37.3	55.5	26	17.1
Fortuna *	37.1	59.2	32	16.4
Olaf	36.3	55.4	27	18.2
Lancer *	36.0	55.3	31	18.1
MT 8182	35.4	54.0	26	17.4
Cutless *	35.1	58.4	27	18.6

Cooperator and Location : Chuck Merja, southeast of Sun River.

Planting Date : April 19, 1989.

Harvest Date : July 31, 1989.

Previous Crop : Fallow

Fertilizer : 100# 11-51-0 with the seed and 50# AA.

Soil Moisture Probe Depth at Seeding : 24".

Rainfall from May 18 to Harvest : 6".

\* Sawfly resistant varieties (Amidon and Rambo partial resistance).

Yield Experimental Mean : 39.31

Error Degrees of Freedom : 38.0

F. Test : 2.99

C.V. : 3.86

LSD (0.05) : 4.34

Table 4b. Three year summary for dryland spring wheat grown near Sun River, MT. 1987 - 1988 - 1989. Mont. Agr. Expt. Sta., Western Triangle Research Center, Conrad, MT.

Variety	3-year Comparable Average			
	Yield bu/a	Test wt.	Plant hgt.	% Protein
Len	27.0	58	23	17.3
NK 751	27.0	56	20	16.8
Amidon	26.8	58	26	17.5
Westbred 906R	26.9	57	23	18.2
Newana	26.6	57	23	17.2
Stoa	25.6	57	26	17.6
Pondera	25.6	59	24	18.2
Owens	25.6	56	22	15.4
Glenman	25.0	55	24	16.0
Marshall	24.6	56	21	17.6
Lew	24.3	58	25	17.2
Alex	24.3	57	26	18.1
Rambo	24.0	58	22	17.2
Lancer	23.3	57	26	18.5
Cutless	22.7	59	23	18.6
Fortuna	21.6	59	26	17.2

Table 5a Irrigated spring wheat variety trial north of Fairfield, 1989. Mont. Agr. Expt. Sta., Western Triangle Research Center, Conrad, MT.

Variety	Yield bu/a	Test wt.	Plant hgt. inches	% Protein
Penawawa	86.7	56.8	32	9.9
Westbred 906R	79.8	58.2	33	11.3
Amidon *	73.8	58.3	43	11.5
Marshall	72.8	58.1	30	11.7
Newana	72.0	58.9	30	10.7
NK 751	71.0	56.7	32	10.7
MT 8402	70.3	59.6	31	12.3
Rambo *	70.2	59.4	34	11.1
Owens (s. white)	69.0	56.5	32	10.1
Fortuna *	68.3	56.5	41	11.1
Len	67.7	58.4	33	11.0
Lancer *	66.5	58.5	41	12.6
Lew *	65.8	58.2	43	12.2
Stoa	65.6	57.2	41	11.1
MT 8182	65.3	57.2	32	10.3
Pondera	64.7	57.8	32	12.4
Olaf	61.6	57.4	34	11.8
Glenman *	60.3	57.6	33	11.2
Cutless *	60.2	58.1	38	11.7
Alex	58.1	59.3	42	11.0

Cooperator and Location : Al Meyer, north of Fairfield, Teton County.  
 Planting Date : April 20, 1989.  
 Harvest Date : September 5, 1989.  
 Previous Crop : Barley  
 Fertilizer : 100# 11-51-0 with the seed and 100# N actual topdressed.  
 Irrigation Method : Flood  
 \* Sawfly Resistant Varieties (Amidon and Rambo partial resistance).  
 Yield Experimental Mean : 68.49  
 Error Degrees of Freedom : 38  
 F. Test : 2.7  
 C.V. : 6  
 LSD (0.05) : 11.77

Table 5b. Three year summary for irrigated spring wheat varieties grown near Fairfield, MT. 1986 - 1987 - 1989. Mont. Agr. Expt. Sta., Western Triangle Research Center, Conrad, MT.

Variety	3-year Comparable Average			
	Yield bu/a	Test wt.	Plant hgt.	% Protein
Penawawa	100.3	59	31	10.2
Westbred 906R	92.3	60	32	11.6
Marshall	86.6	60	30	11.5
Owens	86.6	58	31	11.7
Newana	86.0	61	31	10.8
Amidon	85.3	60	41	11.8
Rambo	84.3	60	32	11.5
NK 751	82.6	59	30	11.4
Pondera	80.6	60	31	11.9
Len	79.0	60	31	11.0
Glenman	78.0	60	32	11.5
Lew	77.6	61	38	11.4
Stoa	77.3	60	37	11.3
Alex	75.4	60	39	11.8
Fortuna	73.6	60	37	12.0
Lancer	70.9	60	40	12.8
Cutless	70.4	59	36	12.4

Table 6. Dryland spring triticale variety trial north of Cut Bank, 1989. Mont. Agr. Expt. Sta., Western Triangle Research Center, Conrad, MT.

Variety	Yield bu/a <u>1/</u>	Test wt.	Plant hgt. inches	Relative maturity
Tritot 54	52.1	47.9	37	very late
Wapiti	51.6	45.2	39	late
Juan	51.4	43.4	39	extreme late
Welsh	50.8	44.8	39	medium
Kramer	49.5	47.4	33	very early
Marval	48.3	47.4	43	medium
Tritot 61	46.1	49.7	35	very late
Carman	45.6	45.3	36	early
Karl	45.4	48.6	28	early
Sunland	44.9	44.7	35	very late
Beagle 82	44.2	44.1	39	late
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Newana wheat	30.9	58.2	26	very early
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Cooperator and Location : Don Bradley, 14 miles north of Cut Bank,  
Glacier County.

Planting Date : May 10, 1989.

Harvest Date : September 11, 1989.

Previous Crop : Fallow

Fertilizer : 100# 11-51-0 with the seed.

Soil Moisture Probe Depth at Seeding : 24".

Rainfall, Planting to Maturity : More than 6".

1/ Triticale yield calculated on a 50# test wt.; wheat yield 60# test wt.

Yield Experimental Mean : 2363.26 lbs/acre

Error Degrees of Freedom : 22.0

F. Test : 1.93

C.V. : 6.57

LSD. (0.05) : 455.13 lbs.

Table 7. Dryland spring triticale variety trial east of Oilmont, 1989. Mont. Agr. Expt. Sta., Western Triangle Research Center, Conrad, MT.

Variety	Yield bu/a 1/	Test wt.	Plant hgt. inches	% Protein	Relative maturity
Kramer	28.9	42.3	32	16.8	very early
Tritot 54	27.8	45.1	31	16.5	very late
Carman	25.0	40.4	37	16.7	early
Welsh	24.1	40.0	35	16.5	medium
Sunland	24.0	40.6	30	16.7	very late
Marval	23.4	38.8	39	16.5	medium
Tritot 61	22.8	43.8	32	16.0	very late
Karl	22.8	42.9	28	16.7	early
Wapiti	22.6	40.7	32	16.6	late
Beagle 82	22.2	38.1	32	16.9	late
Juan	21.2	40.2	32	16.7	extreme late
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Newana wheat	19.1	54.5	25		very early

Cooperator and Location : Terry Alme, 8 miles east of Oilmont, Toole County.

Planting Date : April 18, 1989.

Harvest Date : August 3, 1989.

Previous Crop : Fallow

Soil Moisture Probe at Planting : 2' 6".

Rainfall, Planting to Harvest : 6"

1/ Triticale yield calculated on 50-lb test wt.

Fertilizer : 100# 11-51-0 with the seed.

Yield Experimental Mean : 1198.63 lbs/acre

Error Degrees of Freedom : 22

F. Test : 8.91

C.V. : 3.2

LSD. (0.05) : 112.39 lbs.

Table 8. Dryland spring triticale variety trial east of Choteau, 1989. Mont. Agr. Expt. Sta., Western Triangle Research Center, Conrad, MT.

Variety	Yield bu/a <u>1/</u>	Test wt.	Plant hgt. inches	Relative maturity
Tritot 54	76.4	51.3	38	very late
Tritot 61	73.4	54.2	38	very late
Juan	73.3	46.4	40	extreme late
Wapiti	70.0	49.0	40	late
Sunland	68.2	52.7	35	very late
Welsh	67.0	48.3	42	medium
Marval	65.6	48.6	40	medium
Kramer	65.3	49.5	34	very early
Carman	64.2	49.3	38	early
Beagle 82	62.9	47.2	40	late
Karl	57.8	51.6	33	early
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Newana wheat	37.9	60.4	27	very early

Cooperator and Location: Rick Corey, northeast of Choteau, Teton County.  
 Planting Date : April 19, 1989.  
 Harvest Date : August 15, 1989.  
 Previous Crop : Fallow  
 Fertilizer : 100# 11-51-0 with the seed.  
 Soil Moisture Probe Depth at Seeding : 24".  
1/ Triticale yield calculated on 50 lb. test wt.  
 Yield Experimental Mean : 3290.14 lbs/acre  
 Error Degrees of Freedom : 22  
 F. Test : 6.82  
 C.V. : 4.78  
 LSD. (0.05) : 460.84 lbs.