TITLE: Spring Wheat

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USDA-ARS
Montana Wheat Research & Marketing Comm.

SUMMARY:

Advanced Yield Trial - The varieties MT 8289, Ward and NK 2631 all yielded above 100 bu/a, showed low levels of Septoria infection and were resistant to leaf rust, powdery mildew and lodging.

Western Regional Nursery - Sixteen spring wheat varieties significantly out-yielded Owens, the check variety. Most of those varieties were resistant to both leaf rust and powdery mildew.

INTRODUCTION:

In an effort to continually test new and improved spring wheat varieties in western Montana variety nurseries are evaluated annually at the Northwestern Agricultural Research Center. These nurseries, through accumulated years of testing, are the proving grounds for all Montana recommended spring wheat varieties.

RESULTS:

Advanced Yield Trial - Five varieties yielded significantly greater than Newana, the check variety (77 bu/a), with three of those topping 100 bu/a (MT 8289, Ward and NK 2631). Five varieties also yielded significantly less than Newana, among those being Lew, Fortuna and Thatcher.

Test weights ranged from 46.5 to 57.1 lbs/bu. Fourteen varieties were significantly higher in test weight with Ward being the only variety with a significantly higher yield also. Test weights were slightly below normal due to foliar diseases.

Lodging was moderate to severe in seven varieties. Any variety with lodging percent or severity greater than 19% and 1.56 respectively was significantly different when compared to Newana, which had no lodging. As would be expected more severe lodging was seen in plots with low yields (Lew, Fortuna, Thatcher and MT 8043).

Heading dates varied by variety and since Newana heads a little later than most varieties there were thirty-one entries which were significantly different in heading (earlier).

Leaf rust was light throughout the trial yet five varieties showed moderate to severe suceptibility to that disease. Marberg, Thatcher, MT 8228 and MT 8043 were heavily infested with rust.

Septoria was prevalent in this study and was recorded in every variety. Four varieties showing a significantly less reaction to Septoria, as compared to Newana, were Ward, Crosby, Vic and Butte.

Results (con't)

Powdery mildew was very light this year. Owens showed the highest level of infection (significantly greater in comparison to Newana) of mildew with Waverly and MT 8286 showing moderate reactions.

Western Regional Nursery - Sixteen varieties (ranging from 76.4 bu/a to 92.7 bu/a) yielded significantly higher than the check variety, Owens (57.8 bu/a). Only one variety yielded so low as to be significantly different from the check and that was Federation at 34.3 bu/a.

Test weights were generally low for this nursery with the average being 48.2 lbs/bu. Eight varieties had significantly higher test weights, seven of which also had better yields. Waverly, UT 541815, and Federation had significantly lower test weights.

Approximately half of the entries showed some lodging during the season with five varieties being severely affected.

Leaf rust was not as prevalent in this nursery yet was recorded at high levels in seven varieties, most of which were poor yielding varieties. Septoria was severe in this nursery and recorded in all varieties. The varieties showing the lowest Septoria infection were ID 247 and OR 750573 which had mild reactions. Eighteen varieties showed resistance to Powdery mildew. Of the remaining entries five had high susceptibility to powdery mildew (Table 2).

SPRING WHEAT VARIETIES

SPRING WHEAT VARIETIES RECOMMENDED FOR WESTERN MONTANA

Hard Red Varieties

1. Borah - non-irrisated and irrisated
2. Fortuna - dryland
3. Newana - dryland and irrisated
4. Pondera - dryland and irrisated
5. Marbers - dryland and irrisated

Soft White Variety

1. Owens - dryland and irrisated

CHARACTERISTICS OF RECOMMENED VARIETIES

Hard Red Varieties

1. Borah
   a. Bearded variety
   b. Very high yielding ability
   c. Semi-dwarf type
   d. Medium maturity
   e. Low to fair test weight
   f. Resistant to shattering
   g. Resistant to stripe rust
   h. Susceptible to leaf rust
   i. Resistant to stem rust

2. Fortuna
   a. Bearded variety
   b. Good yielding ability
   c. Medium to tall height
   d. Medium maturity
   e. High test weight
   f. Poor to fair lodging resistance
   g. Somewhat susceptible to shattering
   h. Resistant to most common races of stem rust
   i. Resistant to to most common races of leaf rust
   j. Fair to good milling and baking quality

Recommended Spring Wheat Varieties (cont'd)

3. Newana
   a. High yielding ability
   b. Semi-dwarf variety
   c. High test weight
   d. High lodging resistance
   e. Good shattering resistance
   f. Resistance to stem rust
   g. Moderately susceptible to leaf rust

4. Pondera
   a. High yielding ability
   b. Semi-dwarf variety
   c. High test weight
   d. Mid-season maturity
   e. Resistance to stem and stripe rust
   f. Moderately resistance to leaf rust

5. Marbers
   a. Good yielding ability
   b. Semi-dwarf variety
   c. Good test weight
   d. Mid-season maturity
   e. Resistance to stem rust
   f. Moderately susceptible to leaf rust
   g. Moderately resistant to stripe rust

Soft White Varieties

1. Owens
   a. Bearded variety from Idaho
   b. Very high yielding ability
   c. Semi-dwarf type
   d. Medium maturity
   e. Fair test weight
   f. Good straw strength
   g. Good shattering resistance
   h. Resistant to stem and stripe rust

Table ___. Agronomic data from the Spring Wheat Advanced Yield Trial grown on the Northwestern Agricultural Research Center, Kalispell, MT. in 1983. Field No. Y-5, randomized block design,four replications. Plot size : 32 sq.ft.

Date seeded: April 18,1983 Date harvested: September 16, 1983

	VARIETY	YIELD BU/A	TEST WT LBS/BU	% LODG.	LODG. SEVER.	HEAD DATE	HEIGTH INCHES
MT8289	TANAGER'S'-CROSSCM30	110.34a	55.18	.00	.00	177.25b	38.68
CI15892	WARD	102.26a	56.80a	.00	.00	176.75b	47.83a
NK2631	NK715	100.05a	54.62	.00	.00	181.50a	42.62a
CI17903	MCKAY	98.95a	53.85	.00	.00	179.50	39.67
MT8213	MS2315/MT7418	98.80a	55.80a	.00	.00	179.00	38.39
MT8177	KALIF/S6921	95.96	55.72a	.00	.00	179.00	39.76
OSLO	NA18374 NAPB	95.59	53.35	.00	.00	175.25b	38.29
CI17827	CROSBY	95.17	56.00a	30.00a	2.00a	177.25b	48.62a
ND582	ND527/COTEAU'S'//ERA	95.07	56.35a	.00	.00	178.00b	46.56a
WRF 8-1	MSFRS GERMPLASM CC A	94.96	56.00a	.00	.00	176.00b	38.68
CI17934	GUARD	94.32	56.05a	7.50	.50	174.75b	42.13a
CI17790	LEN	94.14	54.08	.00	.00	177.25b	40.45a
CI15930	OLAF	91.15	55.30	.00	.00	176.75b	40.75a
MT7836	4553/SHERIDAN	90.80	54.02	.00	.00	177.25b	40.16
CI17920	MARSHALL	90.69	54.77	.00	.00	179.00	38.58
WRF 8-30	MSFRS GERMPLASM CC A	89.26	55.60a	.00	.00	175.00b	38.78
MT781	ND6850/FORTUNA	89.19	57.08a	10.00	1.25	177.50b	49.02a
MT8202	MX2315/NORANA	87.56	54.15	.00	.00	177.75b	37.50
MT7926	ND681/MT6830	87.36	55.72a	7.50	2.00a	178.75b	46.56a
CI17910	ALEX	87.02	56.40a	28.75a	2.25a	179.00	47.64a
MT8233	CI15838/MT7418	86.81	54.72	.00	.00	179.25	39.67
CI17789	VIC	86.64	55.87a	6.25	.75	178.50b	50.00a
MT8266	PI134593/MT7440	86.21	53.17	.00	.00	175.75b	39.96
MT8017	FB434/MT7149	86.01	54.23	.00	.00	179.25	39.07
MT8207	MX2315/PONDERA	85.51	55.28	.00	.00	174.50b	37.89
CI17911	WAVERLY	83.42	47.10b	.00	.00	180.75	40.16
MT8282	PI1345931/MT7440	82.59	49.37b	.00	.00	177.25b	38.09
LLOYD	PI147a211	81.37	50.23b	.00	.00	181.25	34.15b
CI17904	OWENS	80.80	50.30b	27.50a	4.25a	179.25	39.57
MT808	JARAL'S'/NORANA	80.24	50.35b	.00	.00	177.75b	37.89
CI17438	CANDO	79.90	51.10b	.00	.00	180.00	33.86b
CI17420	NEWANA 1/	79.64	53.52	.00	.00	180.00	38.39
CI17828	PONDERA	77.01	55.20	.00	.00	177.25b	39.07
CI17681	BUTTE	76.01	55.75a	2.50	.75	175.50b	42.81a

Table 1 (con't)

	VARIETY	YIELD BU/A	TEST WT LBS/BU	% LODG.	LODG. SEVER.	HEAD DATE	HEIGTH INCHES
CI17935	CENTA	74.95	56.68a	27.50a	1.75a	174.50b	45.57a
MT8218	CI15838/MARBERG	74.71	50.87b	3.75	1.75a	177.50b	41.14a
MT8274	PI1345931/MT7336	72.96	52.80	.00	.00	174.75b	37.01
LEADER	CANADA	71.99	54.00	.00	.00	178.50b	39.57
MT807	JARAL'S'/NORANA	69.77	51.95	.00	.00	179.00	37.01
SD2861	EUREKA/PRODAX	69.76	49.83b	68.75a	5.25a	174.75b	39.07
MT814	NORANA/SHASHI	69.21	48.62b	48.75a	4.00a	179.00	37.80
MT8184	AU/MAYA74'S'	68.25	49.80b	.00	.00	178.25b	36.52
MT7819	4553/FORTUNA	64.76	19.10b	72.25a	6.00a	179.25	40.06
CI17829	MARBERG	63.37	52.48	2.50	.50	174.75b	39.57
CI17429	LEW	62.29b	54.38	73.75a	6.75a	181.50	47.93a
CI13596	FORTUNA	61.15b	53.43	72.50a	6.25a	178.50b	47.44a
CI10003	THATCHER	59.05b	52.93	43.75a	3.25a	178.25b	50.59a
MT8228	CI15838/MT7418	56.02b	52.17	.00	.00	176.75b	38.78
MT8043	PK176//SI/MT7149	54.00b	46.48b	55.00a	4.25a	179.00	41.73a
	$\bar{X}$	82.31	53.45	12.01	1.09	177.82	41.04
	F 2/	4.51**	15.85**	11.13**	11.66**	19.49**	39.19**
	S.E.X.	6.18	.68	6.76	.56	.43	.67
	L.S.D.	17.28	1.89	18.89	1.56	1.21	1.87
	C.V. %	7.51	1.26	56.28	51.18	.24	1.63

1/ Check variety
2/ F value for variety comparison
** Indicates statistical significance at the .01 level
a/ Values significantly greater than the check at the .05 level
b/ Values significantly less than the check at the .05 level

Table 2. Agronomic data from the Spring Wheat Advanced Yield Trial grown on the Northwestern Agricultural Research Center, Kalispell, MT. in 1983. Field No. Y-5, randomized block design, four replications. Plot size: 32 sq. ft.

Date seeded: April 18,1983 Date harvested: September 16, 1983

		***** see footnotes for disease ratings at end of table****							
VARIETY		RUST % PLOT	RUST SEV.	SEPT. % PLOT	SEPT. SEVER.	SEPT. STAGE	MILDEW % PLOT	MILDEW SEVER.	MILDEW STAGE
MT8289	TANAGER'S'-CROSSCM30	.00	.00	17.50b	6.25	6.00	.00	.00	.00b
CI15892	WARD	.00	.00	12.50b	7.50	4.50b	.00	.00	.00b
NK2631	NK715	.00	.00	41.25	10.00	6.00	.00	.00	.00b
CI17903	MCKAY	.00	.00	25.00	6.25	5.75	1.25	1.25	1.25
MT8213	MS2315/MT7418	.00	.00	67.50	11.25	7.00	5.00	1.25	1.50
MT8177	KALIF/S6921	.00	.00	63.75	7.50	7.25	15.00	6.25a	1.50
OSLO	NA18374 NAPB	.00	.00	70.00	13.75	7.25	1.25	1.25	1.25
CI17827	CROSBY	.00	.00	10.00b	6.25	5.25b	.00	.00	.00b
ND582	ND527/COTEAU'S'//ERA	.00	.00	61.25	13.75	6.75	.00	.00	.00b
WRP 8-1	MSFRS GERMPLASM CC A	.00	.00	56.25	6.25	7.25	.00	.00	.00b
CI17934	GUARD	.00	.00	45.00	6.25	6.50	.00	.00	.00b
CI17790	LEN	.00	.00	76.25	12.50	7.25	.00	.00	.00b
CI15930	OLAF	.00	.00	47.25	8.75	7.75	.00	.00	.00b
MT7836	4553/SHERIDAN	74.25a	15.00a	73.75	16.25	7.00	.00	.00	.00b
CI17920	MARSHALL	.00	.00	63.75	10.00	7.00	.00	.00	.00b
WRP 8-30	MSFRS GERMPLASM CC A	.00	.00	62.25	10.00	7.25	.00	.00	.00b
MT781	ND6850/FORTUNA	.00	.00	94.50a	32.50a	7.75	.00	.00	.00b
MT8202	MX2315/NORANA	.00	.00	48.75	8.75	6.25	.00	.00	.00b
MT7926	ND681/MT6830	.00	.00	42.50	7.50	6.50	18.75	1.25	2.00
CI17910	ALEX	.00	.00	57.50	11.25	7.50	.00	.00	.00b
MT8233	CI15838/MT7418	.00	.00	79.75	17.50a	7.00	.00	.00	.00b
CI17789	VIC	.00	.00	5.00b	3.75	3.75b	.00	.00	.00b
MT8286	PI134593/MT7440	.00	.00	91.25a	13.75	7.75	35.00a	6.25a	2.75
MT8017	FB434/MT7149	47.25a	2.50	87.50a	12.50	8.00	.00	.00	.00b
MT8207	MX2315/PONDERA	48.50a	3.75	94.50a	12.50	7.75	.00	.00	.00b
CI17911	WAVERLY	7.50	1.25	67.25	6.25	7.25	41.25a	5.00	4.00
MT8282	PI1345931/MT7440	.00	.00	57.50	11.25	7.00	23.75a	2.50	1.75
LLOYD	PI1476211	12.50	5.00	85.00a	11.25	7.75	.00	.00	.00b
CI17904	OWENS	.00	.00	32.50	6.25	6.50	75.00a	10.00a	7.50
MT808	JARAL'S'/NORANA	.00	.00	83.75a	13.75	7.00	.00	.00	.00b
CI17433	CANDO	.00	.00	94.50a	20.00a	7.75	.00	.00	.00b
CI17420	NEWANA 1/	.00	.00	32.50	7.50	6.75	1.25	1.25	2.25
CI17828	PONDERA	.00	.00	80.00	7.50	6.75	.00	.00	.00b
CI17691	BUTTE	.00	.00	16.25b	6.25	5.25b	.00	.00	.00b

Table 2 (con't)

VARIETY		***** see footnotes for disease ratings at end of table**** RUST % PLOT	RUST SEV.	SEPT. % PLOT	SEPT. SEVER.	SEPT. STAGE	MILDEW % PLOT	MILDEW SEVER.	MILDEW STAGE
CI17935	CENTA	.00	.00	12.50b	5.00	6.00	.00	.00	.00b
MT8218	CI15838/MARBERG	24.75a	5.00	57.50	7.50	6.25	.00	.00	.00b
MT8274	PI1345931/MT7336	.00	.00	99.00a	48.75a	8.00	.00	.00	.00b
LEADER	CANADA	.00	.00	67.25	10.00	7.50	.00	.00	.00b
MT807	JARAL'S'/NORANA	.00	.00	78.50	20.00a	7.00	.00	.00	.00b
SD2561	EUREKA/PRODAX	.00	.00	99.00a	35.00a	8.00	.00	.00	.00b
MT814	NORANA/SHASHI	.00	.00	71.25	12.50	7.00	.00	.00	.00b
MT8184	AU/MAYA74'S'	.00	.00	99.00a	38.75a	8.00	.00	.00	.00b
MT7819	4553/FORTUNA	20.00	1.25	81.00	12.50	7.25	.00	.00	.00b
CI17829	MARBERG	99.00a	45.00a	94.25a	11.25	8.00	.00	.00	.00b
CI17429	LEW	.00	.00	66.25	10.00	6.25	.00	.00	.00b
CI13596	FORTUNA	.00	.00	99.00a	17.50a	8.00	.00	.00	.00b
CI10003	THATCHER	99.00a	32.50a	84.75a	18.75a	7.75	23.75a	7.50a	2.75
MT8228	CI15838/MT7118	99.00a	60.00a	95.75a	20.00a	8.00	.00	.00	.00b
MT8043	PR176//ST/MT7149	99.00a	36.25a	96.75a	18.75a	8.00	.00	.00	.00b
	$\bar{X}$	12.87	4.23	64.60	13.24	6.96	4.92	.89	.58
	F 2/	13.59**	13.62**	6.56**	6.47**	3.99**	3.80**	2.17**	2.96**
	S.E.X.	8.06	3.37	10.61	3.53	.47	7.07	1.50	.29
	L.S.D.	22.54	9.42	29.66	9.86	1.32	19.75	4.19	2.23
	C.V. %	62.64	79.54	16.42	26.63	6.80	143.52	167.95	137.14

1/ Check variety
2/ F value for variety comparison
** Indicates statistical significance at the .01 level
a/ Values significantly greater than the check at the .05 level
b/ Values significantly less than the check at the .05 level

*** FOOTNOTES FOR DISEASE RATINGS ***

Leaf rust; % plot = percent plot infected with disease (Puccinia recondita)
Leaf rust, severity = average leaf area (percent) infected by the disease
Sept. % plot = percent plot infected with disease (Septoria spp.)
Sept. sever. = average leaf area (percent) infected by the disease
Sept. stage = stage of development of the disease; 1-9 scale; 1= crown infected, 9 = head infected
Mildew % plot = percent plot infected with disease (Erysiphe graminis)
Mildew sever. = average leaf area (percent) infected by the disease
Mildew stage = stage of development of the disease, 1-9 scale, 1= crown infected, 9 = head infected