

PROJECT TITLE: Winter Wheat Variety Evaluations

YEAR/PROJECT 1986/756 Small Grains Production

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SUMMARY:

To determine the adaptability of new and introduced winter wheat varieties to Montana the Western Regional Winter Wheat nurseries are grown at the Kalispell and Stillwater locations. The outstanding varieties from these trials are tested under varying growing conditions of western Montana through off station nursery evaluations. These data are used in making recommendations to the Montana producer.

Continuous snow this year in the Kalispell area was from Nov. 16 to March 3 (105 days). Although conditions appeared favorable for snow mold there was very little incidence of that disease in the winter wheat nurseries. Yields and test weights were good this year in all the nursery locations.

Western Regional Hard Red Wheat Nursery - Kalispell

Yields were equal to last year with the average for the nursery (73.81 bu/A) being just slightly higher than the previous year. Eighteen varieties had yields significantly less than the check variety ,Winridge (83.09 bu/A). No varieties yielded significantly higher than Winridge.

High test weights were recorded this year with 14 varieties having test weights significantly greater than Winridge (61.17 lbs/Bu).

Winter kill, although not severe, was as high as 30% in the varieties Winridge, ID 0337, OR 8315, and ID 0338. These % winter kill ratings were taken early in the spring and do not accurately reflect percent stand loss from which to calculate yield loss. The lodging index figure is calculated by multiplying lodging severity (based on a 1-9 scale of degree of lodging) times prevalence (% of plot effected), divided by nine. There was minimal lodging in this nursery. Very little TCK smut was recorded in this nursery. Table 1.

Western Regional Hard Red Wheat - Stillwater

Yields from the Stillwater location were the highest in four years which was a reflection of the good fall and spring moisture with a favorable 1986 growing season. Winter kill averaged 38% for the nursery and a high of 59% was noted for OR 8315. Test weights for ID 298 and WA 7269 exceeded 63 lbs/Bu. Table 2.

Western Regional Soft White Wheat - Kalispell

Yields ranged between 26.8 and 97.9 bu/A with the check variety (Stephens) yielding 79 bu/A. Eight varieties yielded significantly higher than Stephens while six varieties yielded significantly less. Test weights

for the nursery averaged 57.8 lb/bu with Stephens having a test weight of 56.7 lbs/bu. Winter kill was not severe but did occur throughout the nursery at an average of 5.2 % . WA 7163, WA 7126, and WA 7432 had no occurrence of winter kill. Smut was prevalent and was detected in all but four varieties (WA 7431, WA 7432, WA 7434, and WA 7217). OI 754989 had the highest level of smut with 43.8% of the heads showing some infection. Table 3.

Western Regional Soft White Wheat - Stillwater

WA 7431 was the highest yielding entry in the test at 102 bu/A and was the only variety yielding significantly higher than Stephens, the check variety. OI 754022 and OI 754989 were both significantly less in yield than Stephens. Test weights averaged 59.24 lbs/bu with only six varieties varying significantly from Stephens (59.38 lbs/bu). Winter kill was severe in this nursery with percentages as high as 67.5% in Kharkof. The average for the nursery was 32.6%. This reading was taken in early spring and may not have a relationship to yields obtained. Table 4.

Intrastate Winter Wheat - Kalispell

Yields were excellent for this nursery ranging from 79.5 to 137.7 bu/A. Winridge was used as a check variety and yielded 118.2 bu/A. Two varieties (Neely and MT 84165) yielded significantly higher than Winridge. The test weights for this nursery averaged 61.37 lbs/bu. Several varieties had test weights significantly higher than Winridge. Although winter kill was not severe there was some loss in each variety tested. Lodging was moderate, being observed in 23 of 40 varieties. Leaf rust was detected in all varieties tested and exceeded 50 % severity in eight varieties. Table 5

Off Station Winter Wheat Nurseries

The 1986 off station winter wheat nurseries were grown on the Ross McIntyre farm (Ravalli Co.), the Dean Stipe farm (Lake Co.), and at the Stillwater location near Kalispell. Neely, Lewjain, and MT 79125 were the top three yielding varieties when averaged across the three locations. Neely and Lewjain yielded in the top four entries of each location. Yields were good at each location and representative of the weather conditions for each area. Neely also had the second highest test weight compared across the three locations for the season. Weston had the highest test weight at each location. Percent stands were good at Lake and Ravalli Co. locations but were poor at the Stillwater location. Table 6.

Tabel 4. (Con'd)

VARIETY	ENTRY #	YIELD Bu/A	TEST WT Lbs/bu	HT (")	% WNTR KILL
ID 0330	NEELY SPN//SPN	54.45	58.33	24.31	67.50a
KHARKOF	CI 1442	54.28	57.13b	32.38	25.00
WA 7437	PAHA/CI13645/2	52.15	58.07	27.26	53.75a
OI 754022	RDL/SU92/KALIA	42.83b	56.78b	24.21	40.50
OI 754989	MNIM/KAL/8B	30.17b	54.40b	24.21	28.75
OVERALL MEAN		69.97	59.24	25.64	32.58
F-RATIO TRTS 2/		2.907**	5.031**	.9527	2.578**
CV (SE/MEAN)		11.60	1.062	7.064	27.63
LSD (0.05)		22.75	1.764	5.076	25.23

1/ Check variety

2/ F value for variety comparison

** Indicates statistical significance at the .05 probability level

a/ Values significantly greater than the check at the .01 level

b/ Values significantly less than the check at the .01 level

Table 5. Agronomic data from the Intrastate winter wheat nursery grown on the North-western Agricultural Research Center, Kalispell, MT in 1986. Seeded September 24, 1985 Harvested August 15 1986.

VARIETY	ENTRY PEDIGREE	YIELD BU/A	TEST WT LB/BU	HT (")	HEADING DATE	%WNTR KILL	LODG 1/ INDEX	LF RUST SEVER 2/
NEELY	CI 17860	137.7a	61.97a	44.39	161.3b	4.500	24.08	60.00a
MT 84165	CST//FRD1628/OLESEN(F1	134.8a	61.65a	43.31	155.3b	5.000	8.325	32.50
MT 8039	LCO//FRD//NE69559/WNK	132.0	61.65a	39.17b	160.3b	2.000	.0000	30.00
MT 8030	TXGSA268//FRD//YTD-11	131.7	62.15a	39.47b	159.8b	3.250	.0000	32.50
NUGAINES	CI 13968	128.2	59.75	31.40b	163.5	11.25	.0000	32.50
HAWK	NA 200	127.6	62.05a	34.45b	155.8b	5.000	.0000	32.50
MT 84268	CST//FRD1650/OLESEN(F1	125.2	61.15	41.63	159.3b	1.500	1.100	42.50
BIGHORN	RH 78W296	124.9	61.18	34.35b	161.0b	6.750	.0000	10.00
QT 515	HYBRITECH	124.8	60.75	38.98b	160.3b	6.000	14.85	42.50
MT 80203	YGSS2458/6/FWN	124.6	61.95a	41.63	161.8b	3.250	13.90	42.50
MT 84496	CST//FRD1655/OLESEN(F1	123.8	60.35	44.29	159.8b	3.500	40.05a	55.00a
MT 7951	LANCOTA/WNK//NE68510	120.9	62.13a	40.85b	159.3b	3.250	2.775	40.00
MT 84458	CST//FRD1655/OLESEN(F13	120.4	61.00	37.30b	155.3b	3.250	8.325	25.00
MT 81139	CST//FRD/OLESEN/3/STR	119.3	61.88a	36.52b	159.8b	5.750	.0000	27.50
THUNDERBIRDNA	0001	118.6	62.70a	38.29b	155.5b	8.750	.0000	5.000
WINRIDGE	CI 17902 1/	118.2	60.65	44.00	164.0	5.750	9.725	17.50
MT 79123	UT755079/CST5611//TX65	117.2	60.00	32.28b	154.0b	11.50	.0000	25.00
MT 7811	FRD/WNK//MT6928	113.4	60.70	42.32	161.3b	2.000	14.57	79.00a
QT 524	HYBRITECH	113.4	59.58b	41.24	160.3b	4.500	16.50	15.00
CENTURK	CI 15075	111.5	62.58a	41.83	157.5b	4.500	32.23	17.50
ROCKY	NA 1316	111.5	62.25a	42.42	160.0b	4.500	32.22	20.00
ARCHER	NA 201	111.1	58.97b	34.25b	159.3b	3.250	.0000	37.50
MT 80122	SS63283/6*CNN	110.9	61.58	40.85b	161.0b	2.500	.0000	40.00

Table 5. (Cont'd)

VARIETY	ENTRY PEDIGREE	YIELD BU/A	TEST WT LB/BU	HT (")	HEADING DATE	%WNTR KILL	LODG 1/ INDEX	LF RUST SEVER
MT 79121	UT755079/CST56//TX65	109.2	59.65b	34.25b	154.0b	4.000	.0000	47.50a
MT 8003	REDWIN SEL	108.9	62.67a	43.50	161.5b	3.500	.0000	50.00a
REDWIN	CI 17844	108.0	62.80a	44.00	161.3b	2.750	.0000	65.00a
CREE	PI 491532	107.2	62.25a	45.77	160.8b	8.750	45.60a	45.00
NORWIN	PI 491533	106.3	60.83	28.64b	162.8	2.750	.0000	42.50
MT 80459	CST//FRD1628.OLESEN(F1	105.6	61.95a	43.01	156.0b	3.250	31.93	45.00
ROSEBUD	PI 473570	105.2	61.82a	45.96	159.0b	3.250	6.650	42.50
MT 79125	UT755079/CST56//TX65	104.0	58.50b	33.76b	160.3b	5.250	.0000	20.00
WINALTA	CI 13670	100.0b	61.95a	44.49	161.0b	7.000	30.45	35.00
NORSTAR	CI 17735	99.07b	62.42a	45.67	164.3	3.250	47.08a	52.50a
AGASSIZ	ND 7687	98.05b	62.70a	47.34a	160.0b	5.000	11.68	52.50a
ROUGH RIDER	CI 17439	92.60b	62.15a	46.56	161.3b	3.500	24.45	15.00
CITATION	SR 17439	90.25b	60.55	31.10b	152.3b	5.750	.0000	12.50
WARRIOR	CI 13190	87.14b	61.38	45.67	158.8b	6.750	16.25	50.00a
CHEYENNE	CI 8885	82.74b	61.80a	45.77	161.8b	2.750	35.95	42.50
FROID	CI 13872	79.46b	61.53	46.36	162.8	4.500	37.52a	22.50
OVERALL MEAN		112.4	61.37	40.44	159.5	4.705	12.98	35.94
F-RATIO TRTS		5.780	9.647	20.87	33.15	1.117	2.581	2.363
CV (SE/MEAN)		5.271	.5653	2.742	.3129	46.60	73.05	29.36
LSD (0.05)		16.60	.9720	3.107	1.399	6.143	26.56	29.56

1/ Lodging index = lodging severity X prevalence / 9

2/ LF Rust severity = severity of leaf rust within plot

3/ F value for variety comparison

** Indicates statistical significance at the .01 level

a/ Values significantly greater than the check (Winridge)

b/ Values significantly less than the check (Winridge).

Table 6. Agronomic data from the Offstation Winter Wheat nurseries grown in Lake, Ravalli, and Flathead Counties in 1986.

VARIETY	YIELD			\bar{x}	TEST WEIGHT LBS/BU			\bar{x}
	LAKE	RAVA	FLAT		LAKE	RAVA	FLAT	
NEELY	86.49	46.84	73.77	69.03	61.93	63.07	61.97	62.32
LEWJAIN	74.37	48.03	70.02	62.32	59.93	60.63	59.97	60.18
LUKE	73.07	42.75	48.52	54.78	59.30	56.07	59.87	58.41
MT 79125	73.06	41.60	66.13	60.76	59.27	61.70	60.53	60.50
HAWK	73.00	27.37	58.27	52.88	60.70	63.00	62.07	61.92
MT 8003	70.55	42.88	56.88	56.77	62.03	63.07	61.33	62.14
WESTON	63.00	42.89	71.82	59.24	62.47	64.67	62.63	63.26
WANSER	62.34	38.38	49.47	50.06	60.60	62.93	61.03	61.52
MT 79123	61.85	32.90	55.15	49.97	58.97	61.87	59.93	60.26
NORWIN	61.82	35.51	72.87	56.73	61.33	62.47	61.77	61.86
TRES	56.75	37.02	64.75	52.84	57.47	59.03	59.33	58.68
STEPHENS	55.01	39.32	71.02	55.12	56.87	59.00	58.60	58.16
DAWS	53.29	41.70	59.68	51.56	59.50	60.37	60.10	59.99
HILL 81	51.97	40.42	44.08	45.49	57.57	59.23	57.80	58.20
MT 79121	51.74	39.83	69.10	53.56	59.20	61.40	60.13	60.24
REDWIN	47.78	38.78	64.88	50.48	61.97	62.90	61.53	62.13
MEAN	63.51	39.76	62.27		59.93	61.34	60.55	
F	1.125	1.565	1.600		22.14**	29.41**	23.76**	
L.S.D.	29.13	11.68	21.54		1.070	1.158	.7776	
C.V.	15.88	10.17	11.97		.6180	.6540	.4445	

VARIETY	HEIGHT (INCHES)				\bar{x}	PERCENT STAND			\bar{x}
	LAKE	RAVA	FLAT			LAKE	RAVA	FLAT	
NEELY	33.33	24.54	31.50		29.79	98.33	100.0	55.00	84.44
LEWJAIN	27.17	21.78	23.88		24.28	76.67	100.0	25.00	67.22
LUKE	27.17	20.60	22.44		23.40	95.00	78.33	22.00	65.11
MT 79125	27.56	24.15	27.43		27.43	93.33	100.0	46.67	80.00
HAWK	27.82	20.21	27.95		25.33	96.67	100.0	30.00	75.56
MT 8003	32.81	23.62	34.51		30.31	95.00	86.67	36.67	72.78
WESTON	35.04	26.90	36.35		32.76	98.33	86.67	75.33	86.78
WANSER	34.65	26.25	32.68		31.19	85.00	95.00	20.00	66.67
MT 79123	25.85	20.08	25.72		23.88	88.33	100.0	50.00	79.44
NORWIN	22.83	17.06	22.44		20.78	95.00	100.0	76.67	90.56
TRES	26.64	18.90	24.15		23.23	95.00	96.67	61.67	84.45
STEPHENS	25.07	20.87	26.90		24.28	80.00	96.67	56.67	77.78
DAWS	26.90	21.00	24.15		24.02	88.33	100.0	29.33	72.56
HILL 81	27.95	22.70	25.72		24.46	66.67	100.0	13.33	60.00
MT 79121	22.70	19.42	26.77		22.96	90.00	100.0	38.33	76.11
REDWIN	31.50	24.28	36.09		30.62	95.00	100.0	48.33	81.11
MEAN	28.44	22.02	28.04			89.79	96.25	41.37	
F	4.881**	8.801**	20.35**			1.399	1.334	3.139	
L.S.D.	5.087	2.670	3.019			21.58	16.37	27.67	
C.V.	6.193	4.203	3.728			8.323	5.891	16.34	