

PROJECT TITLE: Winter Wheat Variety Evaluations

YEAR/PROJECT: 1987/756 Small Grain Production

PERSONNEL: Leader - Vern R. Stewart, Todd K. Keener, Northwestern Agricultural Research Center, Kalispell, MT.

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 nurseries 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 cover began on November 29th and continued until March 2nd ( 94 days ) which was 11 days short of the snow cover last year. Dwarf smut infection levels were low to nonexistent at the Stillwater location whereas at the Kalispell sites there was light smut in the hard red varieties with medium to heavy smut in some of the soft white winter wheat varieties.

Yields at the Kalispell location were much higher this year but the 1987 yields from Stillwater were much lower than last year's.

RESULTS:

Western Regional Hard Red Winter Wheat - Kalispell

Very good yields were recorded from the hard red winter wheat nursery grown at Kalispell. The average yield was 23 bushel above that of last year. The yields of four Utah varieties ( UT 15651a, UT 156712, UT 156775, and UT 156751 ), all exceeded 114 bushel per acre. Excellent yields were reported for most varieties with the mean yield of 96.18 bushels per acre.

Test weights averaged 61.33 lbs/bu. Kharkof had the lowest test weight at 56.83 lbs/bu. Heading dates and heights are reported in Table 1.

Dwarf smut ( TCK ) levels were low in the hard red winter wheats with only four varieties showing susceptibility above .75% . ( WA 7522, OPRC 8320, Wanser, and Kharkof ).

Western Regional Hard Red Winter Wheat - Stillwater

Moderate to low yields were obtained from the Stillwater Hard Red Winter Wheat nursery due to low plant populations which resulted from winter injury, snow mold and flooding of the test site. The average yield of the nursery was 50.68 bu/A, which was approximately 21 bushel less per acre than last year. Two of the Utah varieties that did well at the Kalispell site also were top yielding varieties at this location ( UT156752, and UT 156751 ). Yields were near 60 bu/A.

Test weight, heights and winter survival data are found in Table 2. It should be noted that those data reflect the adverse growing conditions this season.

Western Regional Soft White Winter Wheat Nursery - Kalispell  
-----

Excellent yields were obtained in this nursery. The mean yield was 102.55 bu/A. Twenty-four varieties had yields in excess of 104 bu/A and 26 varieties yielded significantly less than Lewjain (the check variety). Table 3. Elgin had the lowest yield at 44.64 bu/A.

Test weights averaged about 58 lb/bu. Only eight varieties had test weights in excess of 60 lbs/bu. Heading on the average was seven days earlier than the previous season. Smut percentages were higher than in the red wheat nursery with eleven varieties having 5% or higher infection level. Table 3.

Western Regional Soft White Winter Wheat Nursery - Stillwater  
-----

Yields at the Stillwater location were about 16 bu/A lower than the previous year. Stands were reduced up to 60% during the winter. Test weights were down from any other previous year with the average test weight for the nursery being 52.35 lbs/bu. Height was also reduced in comparison to previous measurements due to the environmental conditions.

Intrastate Winter Wheat Nursery - Kalispell  
-----

Yields in 1987 were 27 bu/A below 1986 averages in the Intrastate nursery. Nugaines and Winridge had the highest yields with 108 and 101 bu/A respectively. All but 13 varieties had significantly lower yields in comparison to Winridge. Test weight, height, and heading date were all average for this location ( Table 5 ).

Percent smut was highest ( 2% ) in the variety Roughrider and was detected in the majority of varieties. Lodging, although not prevalent did appear in seven varieties above 20% . The severity of lodging in those varieties was not severe.

Offstation Winter Wheat Nurseries  
-----

The 1987 Offstation winter wheat nurseries grown on the Foss McIntyre farm ( Ravalli Co. ), the Don Callahan farm ( Lake Co. ), and at Stillwater. Neely, MT 2039, Cheyenne and Winridge were they highest yielding varieties when averaged across all locations. Yields were fair for the Stillwater and Lake County location but the stands at the the Ravalli County site were very poor and resulted in very low yields. Table 6. Test weights were good at all locations and were the lowest at the Stillwater location. Table 7.

Table 5. Agronomic data from the Intrastate Winter Wheat Nursery grown on the Northwestern Agricultural Research Center, Kalispell, MT in 1987.  
Date planted: September 16, 1986 Date Harvested: July 31, 1987

VARIETY	Yield Bu/A	Test Wt Lbs/Bu	Heading Date	Height (In)	% Smut	Lodg angle	Lodg %
CI 13968 NUGAINES	108.95	60.60	154.50	34.28b	.00	.00	.00
CI 17902 WINRIDGE 1/	101.43	60.83	155.25	44.52	.12	.50	5.00
MT 8508 CST//FRD1628/OLESE	99.96	62.90	149.75b	44.03	.37	.00	.00
MT 8107 CST//FRD/OLESEN/3/	97.25	62.10	149.50b	42.26	.50	.50	18.75
QT 1359 HYBRITECH	95.17	62.13	148.25b	42.26	.75	.00	.00
CI 17727 WESTON	93.84	63.10	149.75n	46.00	.00	1.00	27.25
NA 1316 ROCKY	93.08	61.85	150.00b	41.86	.37	.00	.00
MT 79121 UT755079/CST56//TX	92.95	59.95	145.00b	36.84b	.25	.00	.00
MT 8039 LCO/FRD//NE69559/W	92.35	59.85	150.75b	38.61b	.37	.00	.00
MT 79125 UT755079/CST56//TX	92.05	60.13	149.75b	36.54b	.25	.50	12.50
MT 85107 CST//FRD1650/OLESE	91.69	61.90	148.25b	39.99b	.50	.00	.00
MT 85111 CST//FRD1650/OLESE	91.04	62.43	148.75b	31.03b	.37	.00	.00
MT 7810 FRD/WNK//MT6928/TD	90.73	60.22	153.25b	38.12b	.12	.00	.00
RH RODEO	90.39b	61.60	147.75b	36.84b	.37	.00	.00
MT 79123 UT755079/CST56//TX	90.04b	60.40	145.75b	36.15b	.25	.00	.00
MT 7951 LANCOTA/WNK//NE685	89.93b	61.85	148.75b	38.61b	.12	.00	.00
NA 200 HAWK	89.85b	62.28	147.75b	37.92b	.88a	.00	.00
MT 8029 TX65A1268/FRD//YTD	89.63b	60.85	149.25b	38.61b	.12	.00	.00
MT 8599 CST//FRD1628/OLESE	89.46b	59.73	148.75b	43.54	.25	.00	.00
CI 15075 CENTURK	89.14b	62.03	148.75b	38.71b1	.12	.50	22.50
MT 8030 TX65A268/FRD//YTD-	88.80b	61.78	149.75b	37.63b	.12	.00	.00
NA 201 ARCHER	88.70b	59.83	150.00b	35.16b	.50	.00	.00
MT 8502 ID745101/LCO	88.54b	61.15	152.75b	36.05b	.37	.00	.00
PI491533 NORWIN	87.94b	61.33	153.25b	29.06b	.12	.00	.00
MT 85203 NE701137/TX65A1503	87.71b	62.05	152.75b	26.30b	.25	.00	.00
RH78W296 BIGHORN	87.41b	60.68	152.75b	34.57b	.00	.00	.00
MT 8003 REDWIN SELN	87.21b	60.95	153.75	43.64	1.25a	.00	.00
MT 85109 CST//FRD1650/OLESE	87.14b	61.93	148.50b	39.20b	.12	.00	.00
CI 17860 NEELEY	85.69b	62.03	154.00	41.27	.50	.00	.00
MT 7811 FRD/WNK//MT6928/TD	85.58b	60.90	152.00b	39.10b	.12	.00	.00
MT 8046 LCO/FRD//NE 69559/	85.55b	61.78	150.50b	37.33b	.63	.00	.00
RH845496 RH 845496	85.44b	61.00	154.25	43.83	.37	.00	.00
RH845504 RH 845504	85.05b	61.52	151.25b	47.08	.75	.00	.00
MT 80194 YG882458/*6WN	84.70b	60.90	153.75	40.88	1.25a	.00	.00
MT 85131 CST//FRD1655/OLESE	83.64b	59.20	148.50b	38.32b	.50	.00	.00
MT 85151 CST//FRD1628/OLESE	83.29b	62.55	148.25b	40.78	.50	.00	.00
CI 17844 REDWIN	83.08b	60.57	152.25b	44.03	.12	.00	1.00
MT 8562 CST//FRD1628/OLESE	81.88b	59.85	148.25b	37.73b	.50	.00	.00
QT 1281 HYBRITECH	81.53b	58.78	150.75b	40.19	.50	.50	24.75
CI 8885 CHEYENNE	81.19b	61.28	152.75b	48.07	.25	2.00a	66.00a
PI491532 CREE	80.51b	60.81	152.50b	45.31	.63	2.00a	57.25a
CI 13872 FROID	80.34b	60.52	154.00	43.64	.75	2.25a	74.25a
NA 0001 THUNDERBIRD-	80.27b	62.35	146.25b	38.51b	.63	.00	.00
RH 1035 RH 1035	80.05b	61.58	145.50b	38.91b	1.00a	.00	.00
CI 17735 NORSTAR	79.13b	61.00	158.00a	48.36	.50	.75	18.75
ND 8002 CTK//FRD/7759-19	79.09b	61.25	155.00	44.52	.25	.25	2.50
RH845457 RH 845457	78.86b	60.70	150.00b	44.33	1.00a	.00	.00

Table 5. (Cont'd) 1987 Intrastate Winter Wheat Nursery

VARIETY	Yield Bu/A	Test Wt Lbs/Bu	Heading Date	Height (In)	% Smut	Lodg angle	Lodg %
MT 85202 NE701137/TX65A1503	78.24b	60.92	152.75b	43.64	.37	.00	.00
MT 85145 CST//FRD1655/OLESE	78.09b	61.13	152.75b	42.55	.37	.00	.00
MT 85104 CST//FRD1650/OLESE	77.88b	61.05	153.50b	43.14	.37	.00	.00
MT 8576 CST//FRD1628/OLESE	77.35b	61.55	153.75	42.16	.75	.00	.00
CI 13190 WARRIOR	76.91b	61.28	151.00b	47.97	1.12a	1.50a	32.25a
MT 80203 YGSS2458/6*WN	76.64b	60.95	154.00	40.48	.25	.00	.00
NA 362-5 AGRIPRO	76.43b	62.52	148.00b	31.32b	.50	.00	.00
MT 85126 CST//FRD1655/OLESE	75.59b	60.83	152.75b	41.86	.50	.00	.00
CI 17439 ROUGHRIDER	75.04b	61.70	153.50b	46.89	2.00a	2.00a	41.00a
MT 8585 CST//FRD1628/OLESE	74.59b	60.15	153.00b	42.06	.37	.00	.00
RH845455 RH 845455	74.49b	61.08	150.00b	37.43b	.12	.00	.00
MT 8519 CST//FRD1628/OLESE	74.47b	61.35	153.00b	42.16	.63	.00	.00
CI 13670 WINALTA	69.99b	61.68	151.75b	46.39	.50	.00	.00
ND 7687 AGASSIZ	67.15b	61.65	153.75	47.08	.50	.00	.00

$\bar{X}$	85.05	61.32	151.05	40.42	.48	.23	6.62
F value	4.08**	1.45*	19.99**	6.89**	2.09**	3.79**	3.05**
C.V.%	4.56	1.73	.40	3.87	52.76	23.24	41.07
L.S.D.	10.83	2.95	1.70	4.37	.70	.80	26.06

- 1/ Check variety for comparison  
 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 6. Agronomic data compiled from the three offstation winter wheat trials of 1987. Yield ( Bu/A ).

CI or State #	VARIETY	YIELD BUSHEL PER ACRES			$\bar{X}$ YIELD
		STILL	LAKE	RAVA.	
CI 17902	WINRIDGE 1/	56.73	43.32	15.45	38.5
CI 17860	NEELEY	56.48	44.05	21.57	40.7
MT 8030	TX65A268/FRD//YT	53.53	45.50	12.72	37.3
MT 8039	LC0/FRD//NE69559	53.42	39.25	24.62a	39.1
NA 200	HAWK	51.73	45.45	6.40b	34.5
CI 15075	CENTURK	50.98	33.22	10.57	31.6
CI 8885	CHEYENNE	50.83	40.77	25.02a	38.9
CI 17727	WESTON	50.43	46.03	14.23	36.9
CI 17844	REDWIN	50.38	37.33	18.97	35.6
NA 1316	ROCKY	48.35	38.17	7.82	31.4
MT 8003	REDWIN SELN	48.33	38.57	22.15	36.4
CI 13670	WINALTA	47.82	40.18	14.27	34.1
CI 17735	NORSTAR	47.43	45.40	18.20	37.0
NA 0001	THUNDERBIRD	45.88	37.75	7.57b	30.4
PI491532	CREE	44.78	42.12	15.82	34.2
NA 201	ARCHER	33.97	42.57	4.33b	26.9
PI491533	NORWIN	32.50	44.33	18.70	31.8
EXPERIMENTAL MEANS		48.45	44.41	15.20	
F TEST FOR VAR. 2/		1.25	.68	5.62**	
S.E. X		5.91	4.42	2.68	
C.V. 2:		12.19	10.68	17.66	
LSD (0.05)		17.02	12.74	7.73	

1/ Check variety

2/ F value for variety comparison

\*\* Indicates statistical significance at the .01 level of probability

a/ Values significantly greater than the check at the .05 level

b/ Values significantly less than the check at the .05 level

Table 7. Agronomic data compiled from the three offstation winter wheat trials of 1987. Test weights ( lbs/bu ).

CI or State #	VARIETY	Test weights - Lbs/Bu			$\bar{X}$ Test wt
		Still	Lake	Raval	
CI 17902	WINRIDGE 1/	56.10	58.37	61.50	58.7
CI 17860	NEELEY	56.77	60.50a	60.50	59.3
MT 8030	TX65A268/FRD//YT	57.20	61.27a	60.00	59.5
MT 8039	LCO/FRD//NE69559	55.30	59.17	59.50	58.0
NA 200	HAWK	58.77a	60.10a	61.80	60.2
CI 15075	CENTURK	57.60a	58.27a	60.50	58.8
CI 8885	CHEYENNE	57.60a	59.17	62.50	59.8
CI 17727	WESTON	58.43a	61.03a	62.00	60.5
CI 17844	REDWIN	58.03a	60.90a	61.00	60.0
NA 1316	ROCKY	57.60a	58.57	58.50	58.2
MT 8003	REDWIN SELN	57.10	61.17a	61.50	59.9
CI 13670	WINALTA	59.03a	61.00a	60.50	60.2
CI 17735	NORSTAR	57.37a	60.70a	60.30	59.5
NA 0001	THUNDERBIRD	58.60a	59.67a	61.80	60.0
PI491532	CREE	57.87a	60.00a	60.80	59.6
NA 201	ARCHER	55.10	59.50a	60.00	58.2
PI491533	NORWIN	58.47a	61.43a	61.00	60.3

EXPERIMENTAL MEANS	57.47	60.05	0.0
F TEST FOR VAR. 2/	7.49**	9.52	0.0
S.E. X	.42	.34	0.0
C.V. 2:	.72	.57	0.0
LSD (0.05)	1.20	.99	0.0

1/ Check variety

2/ F value for variety comparison

\*\* Indicates statistical significance at the .01 level of probability

a/ Values significantly greater than the check at the .05 level

b/ Values significantly less than the check at the .05 level

Table 8. Agronomic data compiled from the three offstation winter wheat trials of 1987. Height ( Inches ).

CI or State #	VARIETY	Plant Height ( Inches )			$\bar{X}$ Height
		Still	Lake	Raval	
CI 17902	WINRIDGE 1/	36.2	29.40	16.93	27.5
CI 17860	NEELEY	32.3b	28.22	14.44	25.0
MT 8030	TX65A268/FRD//YT	30.3b	28.48	15.22	24.7
MT 8039	LCO/FRD//NE69559	32.9b	28.48	21.26	27.5
NA 200	HAWK	30.4b	24.80b	12.34	22.5
CI 15075	CENTURK	33.9b	23.62b	16.01	24.5
CI 8885	CHEYENNE	34.5	35.04a	21.78	30.4
CI 17727	WESTON	35.3	30.84	19.42	28.5
CI 17844	REDWIN	32.8b	32.02	16.54	27.1
NA 1316	ROCKY	34.6	27.03	13.25	25.0
MT 8003	REDWIN SELN	32.5b	32.15	17.85	27.5
CI 13670	WINALTA	35.4	35.30a	15.75	28.8
CI 17735	NORSTAR	38.3a	40.03a	18.90	32.4
NA 0001	THUNDERBIRD	30.3b	26.51	12.07	23.0
PI491532	CREE	33.7b	33.86a	15.22	27.6
NA 201	ARCHER	27.2b	24.28b	11.68	21.1
PI491533	NORWIN	20.6b	22.44b	14.96	19.3
EXPERIMENTAL MEANS		32.4	29.56	16.10	
F TEST FOR VAR. 2/		34.8	19.88	2.40	
S.E. X		0.0	1.07	1.94	
C.V. 2:		2.10	3.61	12.08	
LSD (0.05)		1.97	3.07	5.60	

1/ Check variety

2/ F value for variety comparison

\*\* Indicates statistical significance at the .01 level of probability

a/ Values significantly greater than the check at the .05 level

b/ Values significantly less than the check at the .05 level