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PROJECT TITLE: 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 cultivars from these trials are then tested under the varying growing conditions of western Montana through Off-station Nursery evaluations. These data are used in making recommendations to the Montana producer.

The extreme climatic and environmental conditions that existed in western Montana this summer did not have as much effect on the winter wheat crop as was seen in the spring grain. Yields were lower in comparison to the excellent yields from the previous year. The incidence of smut was not as high as other years yet the level was enough to evaluate most of the cultivars for TCK smut resistance. Lodging was only a problem in the Hard Red Winter Wheat Nursery at Kalispell, and this was in response to an early summer rain storm.

RESULTS: Western Regional Hard Red Winter Wheat - Kalispell

Yields were equal to the previous season which may be a reflection of the open winter weather conditions. The highest yields were from five entries which resisted lodging (OI 730875, OI 602137, WA 7172, ORCR 8313, and MT 7877). These five varieties were also significantly higher in yield than the check variety, Wanser.

The average height for the nursery was greater than previous years. The heading dates were about twelve days later than last year. Both of these agronomic factors were influenced by the wet cool spring and the dry hot summer. Test weights were also affected by the climatic conditions. ORCR 8313 had the high test weight of 60.3 lbs./bu.

Stripe rust (*Puccinia striiformis*) was detected in the nursery and occurred on all varieties except OI 730875 and WA 6815. MT 8003, ID 0280, and Kharkof were very susceptible to stripe rust.

ORCR 8313, besides having the highest test weight also showed fair resistance to stripe rust, and had excellent straw strength. See Table 1.

- Western Regional Hard Red Winter Wheat - Stillwater

The yields from the Stillwater location were lower than those of Kalispell and also noticeable lower than yields from the same location last year.

Test weights were much lower than previous seasons and varied from 47.5 to 57.2 lbs/bu.

TCK smut was not prevalent in high percentages yet was detected in all but ID 0282, ID 0283, UT 125327, Cree, ID 0281, and ID 0280. The two highest yielding varieties were also found to be smut-free. See table 2.

- Western Regional White Winter Wheat - Kalispell

Yields were slightly lower and test weight averages slightly higher than in 1983. One variety (WA 7164) had a significantly higher yield than LewJain, was smut resistant, and showed excellent lodging resistance.

Stripe rust was prevalent throughout the nursery, although not at a high level. It was detected in all varieties except OR 7996 and OI 754989. Stripe rust was especially heavy in the varieties Elsin and Kharkof which had 85 and 45 % severity respectively.

TCK smut was light yet was detected in all but seven varieties.

Lodging was significantly less in the white wheat in comparison to the red varieties. As expected, the three low yields were recorded in those entries that were most susceptible to lodging.

WA 7164 had a significantly higher yield than the check variety (LewJain), was smut resistant, and showed excellent lodging resistance. See table 3.

- Soft White Winter Wheat - Stillwater

Yields from the White Wheat nursery at Stillwater ranged from 40.2 to 71.8 bu/A and were much lower than last year. WA 7166 and OI 754989 had significantly higher yields than LewJain.

There were twelve varieties that had test weights which were significantly less than LewJain. The test weights in general were less than previous season due to the dry hot summer.

The lack of snow cover for most of the winter resulted in a low incidence of TCK smut. Although there was not a high level of the disease WA 6819, LewJain, and WA 7168 were found to be smut free. See table 4.

- Offstation Winter Wheat Nurseries

In 1984 the offstation winter wheat nurseries were grown in Lake, Sanders, and Ravalli Counties. On a state-wide basis the top yielding varieties were OR 792, LewJain, and Hill 81. The yields varied from 26 to 66 bu/A partly due to location with most locations showing an effect of the drought-like season experienced by most of the state this summer.

Those varieties that had the top three test weights state wide were Weston, OR 792, and Hawk. The test weights from Sanders County really reflected the dry conditions and ranged from 43 to 50 lbs/A.

Height varied according to variety. Table 5 contains a three location summary as well as the state-wide means.

Table 3 Agronomic data from the Western Regional Soft White Winter Wheat Nursery grown on the Northwestern Agricultural Research Center, Kalispell, MT. in 1984. Random block design, four replications, Field No. E-4.

Date seeded: September 19, 1983 Date harvested: August 15, 1984

State or CI #	VARIETY	YIELD BU/A	TEST WT LBS/BU	HEADING DATE	HEIGHT INCHES	2/		3/		LOGGING %
						STRIPE IN TYPE	STRIPE SEVERITY	% SMUT TCK	LOGGING ANGLE	
WA 7164	VPM/MOS9511/YMH/HYS	113.94a	57.73	168.3b	38.68	1.50	13.75	.00	.00	.00
WA 7074	NORCO/VH72297,VH080717	111.26	56.55	172.2b	37.40	1.75	3.75	.00	.00	.00
WA 7166	VPM/MOS421//2*TYEE	110.95	56.88	169.2b	41.34a	2.00	2.75	.00	.75	15.00
CI754989	MNIM/KAL/BB	110.55	60.03a	166.7b	40.75	.00	.00	1.50a	.00	.00
DRCW8314	7C/CND//CAL/3/YMH	106.78	56.15	169.0b	36.81	.25	2.50	.50	.00	.00
WA 6912	BVR/CI 15923/NGS,VH07457	105.71	58.65a	173.3b	37.89	1.00	5.00	.37	.00	.00
WA 7167	VB 72277,WA4996/VH66457/	105.52	58.28a	170.0b	39.47	3.25a	5.00	.00	.00	.00
WA 6910	MARIS HUNTSMAN/VH74521,V	103.15	57.38	172.7b	40.45a	2.00	3.75	.25	.00	.00
CI754022	RDL/SU92/KALIAN/BB	102.21	57.52	165.7b	36.91	1.50	5.00	.75	.00	.00
CI 17419	DAWS	102.18	58.55a	170.8b	37.60	.75	1.25	.50	.00	.00
CI 17773	TYEE	100.73	56.27	170.0b	42.52a	5.00a	4.75	.25	3.00	16.25
WA 7050	PI17346/GMS,SEL292-1//MO	100.35	54.62b	170.8b	37.89	5.50a	31.25a	.00	3.75	46.25a
OR 8188	HYS/NORCO//CAMA//SM4,A13	99.64	57.95a	169.5b	36.02	1.25	6.25	.37	.00	.00
WA 7169	VH 74340,CI14484/66344//	97.68	57.55	169.5b	38.58	2.75a	5.00	2.37a	1.00	3.75
WA 7163	VPM/MOS951112*OR68007	97.60	58.43a	170.8b	38.48	2.25	6.25	.50	.00	.00
DRCW8113	SPN//63189-66-71/BEZ	97.21	56.85	168.5b	36.12	.75	1.25	.37	.00	.00
CI 17926	PHOENIX,WW33	96.89	59.85a	163.0b	36.32	4.25a	17.50a	1.25a	.00	.00
CI 17596	STEPHENS	96.34	57.57	168.5b	39.37	.50	1.25	.37	.00	.00
WA 6819	CJP CLUB/SPRAGUE	96.26	58.08a	171.0b	36.81	2.50	5.75	.25	3.75	36.25a
WA 7165	VPM/MOS421//2*RAEDER	95.56	56.85	170.8b	35.14	1.50	3.75	.25	.00	.00
WA 6698	SW92/6 0/3/T.SP/CTL//3 0	94.99	58.95a	170.0b	42.62a	4.50a	8.50	.12	1.50	5.00
DRCW8318	1523/DC DMF//RBS,F1/3/WA	94.89	58.38a	170.5b	39.86a	.25	5.00	.12	.00	.00
CI 17909	LEWJAIN	94.85	56.35	176.9	36.42	.25	.25	.12	1.75	5.00
OR 835	1523 DRC/RBS	93.50	55.97	174.2b	38.09	.50	5.00	.63	.00	.00
CI765784	ROMANIA FONDEA 12-71/JUP	93.22	58.08a	166.7b	34.94	2.25	4.50	.50	.75	18.75
WA 7168	VB 72277,WA1996/VH6647/	91.36	56.92	173.0b	36.02	.75	8.75	.00	.00	.00
CI 13968	MUGAINES	86.25	58.15a	170.5b	37.89	3.75a	20.00a	.12	2.00	15.00
OR 7996	HYS/YAYLA//WA4995/3/CERC	85.96	54.40b	174.7b	40.26a	.00	.00	.12	2.50	35.00a
WA 7170	55-1744/7C//SU/RDL	84.59	55.80	170.5b	38.88	.25	1.25	1.50a	.00	.00
CI 13740	MORO	65.82b	55.85	169.0b	43.90a	3.75a	14.50	.00	7.50a	87.50a
CI 11755	ELGIN	62.79b	56.33	170.5b	44.98a	8.00a	84.75a	.37	7.25a	87.00a
CI 1442	KHARKOF	56.39b	56.78	171.5b	52.17a	3.75a	45.00a	1.25a	6.50a	74.75a
	X	95.47	57.30	170.2	39.08	2.13	10.10	.46	1.31	13.92
	F 4/	3.90**	6.29**	21.48**	8.96**	5.04**	10.40**	3.39**	9.31**	10.21**
	S.E.X.	6.69	.52	.56	1.15	.85	5.15	.30	.72	8.03
	C.V. Z	7.00	.92	.33	2.94	39.63	50.95	65.08	55.07	57.71
	L.S.D.	18.78	1.47	2.06	3.22	2.37	14.45	.84	2.03	22.58

1/ Check variety

2/ Stripe = Stripe rust (*Puccinia striiformis*) ratings. IN TYPE = infection type; 0 = no chlorosis, 5 = necrotic and chlorotic stripes, light to intermediate sporulation, 9 = no chlorosis or necrosis, abundant sporulation
SEVERITY = Severity of disease in plot, Z leaf area infected.

3/ Z Smut, TCK (dwarf smut *Tilletia controversa* kuhn) Ocular observation.

4/ F value for variety comparison.

Table 3a. Ten year summary of yields for the Western Regional White Winter Wheat Nursery grown at the Northwestern Agricultural Research Center, Kalispell, MT 1975-1984.

CI or State No.	Variety	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	- X	Sta. Yrs.	% Nudaines
CI 1442	Kharkof	37.4	61.1	50.7	16.9	78.1	55.5	40.7	59.7	86.2	56.4	54.3	10	69
CI 11755	Elsin	42.3	67.6	57.8	21.3	94.1	68.5	42.5	63.2	84.4	62.8	60.5	10	77
CI 13740	Moro	44.0	69.8	57.0	27.8	96.3	67.4	62.5	84.8	81.1	65.8	65.6	10	83
CI 13968	Nudaines	51.8	80.2	66.0	18.9	93.7	75.3	79.1	130.9	106.0	86.3	78.8	10	100
CI 17596	Stephens	52.3	82.1	60.6	23.4	100.2	99.3	79.8	119.0	109.2	96.3	82.2	10	104
CI 17419	Daws	56.3	92.8	68.7	22.9	--	--	90.9	130.8	114.3	102.3	85.3	9	110
CI 17909	Lewjain			70.2	34.2	104.8	109.7	85.3	130.5	106.0	94.9	92.0	8	112
CI 17773	Tyee					114.6	82.2	91.1	124.1	98.8	100.7	101.9	6	107
WA 6698	Allan Sel. A7815						107.7	54.0	122.3	124.2	95.0	100.6	5	105
OR CW8113	SPN//63189-66-71/BEZ								138.5	128.9	97.2	121.5	3	112
WA 6912	BUR/CI15923/NGS,VH074								137.4	118.3	105.2	120.5	3	112
OR 7996	HYS/YAYLA/WA4995/3/								131.7	109.5	86.0	109.1	3	101
OR 835	1523 DRC/RBS								119.5	105.1	93.5	106.0	3	98
WA 6910	Maris Huntman/VH74521								118.9	109.1	108.2	110.4	3	102
WA 6819	CJ Club/Sprague								93.8	83.3	96.3	91.1	3	85
OR 8188	HYS/NORCO//CAMA///SM									123.2	99.6	111.4	2	116
WA 7047	NORCO/VH72297,VH0807									115.8	111.3	113.6	2	118
CI 17926	Phoenix, WW33									94.5	96.9	95.7	2	99
WA 7050	PI 173467/GNS, Sel 292									87.2	100.4	93.8	2	98
WA 7164	VPM/MOS9511/YMH/HYS										113.9	113.9	1	145
WA 7166	VPM/MOS4521//2*TYEE										110.0	110.0	1	140
OI 754989	MNIM/KAL/BB										110.6	110.6	1	140
ORCW 8314	7C/CNO//CAL/3/YMH										107.8	107.8	1	137
WA 7167	VB72277,WA 4996/VH 664571										105.6	105.6	1	134
OI 754022	RDL/SU92/KALIAN/BB										102.2	102.2	1	130
WA 7169	VH 74340, CI 14484/66344//										97.7	97.7	1	124
WA 7163	VPM/MOS951112 * OR 68007										97.6	97.6	1	124
WA 7165	VPM/MOS 421//2 * RAEDER										95.6	95.6	1	121
ORCW 8318	1523/DC DWF//RBS,F1/3/WA										94.9	94.9	1	120
OI 765784	ROMANIA FONDEA 12-71/JUP										93.2	93.2	1	118
WA 7168	VB 72277,WA 1996/VH 6647										91.4	91.4	1	116
WA 7170	WA 7170 55-1744/7C//SO/RDL										84.6	84.6	1	107

Table 4 Agronomic data from the Western Regional White Winter Wheat nursery grown on the Oscar Buller farm, Kalispell, MT in 1984. Random block design, four replications.

Date planted: September 28, 1983 Date harvested August 20, 1984

State or CI #	VARIETY	YIELD BU/A	TEST WT LBS/BU	HEIGHT INCHES	% SMUT TCK
WA 7166	VPM/MOS421//2*TYEE	71.83 ^a	53.03	33.17	.25
CI754989	MNIM/KAL/BB	71.48 ^a	57.35	33.07	4.25 ^a
ORCW8314	7C/CND//CAL/3/YMH	68.89	53.73	33.37	.25
WA 7050	PI17346/GNS,SEL292-1//MO	67.29	50.70 ^b	30.41	.50
CI 17419	DAWS	66.01	55.70	30.61	2.00
WA 6698	SW92/6 0/3/T.SP/CTL//3 0	64.33	54.70	34.45 ^a	.25
WA 7164	VPM/MOS9511/YMH/HYS	64.24	54.47	31.89	.50
WA 6912	BVR/CI 15923/NGS,VHD7457	63.04	53.35	30.61	.50
ORCW8318	1523/DC DWF//RBS,F1/3/WA	62.91	55.72	34.45 ^a	.50
WA 7167	VB 72277,WA4996/VH66457/	62.65	54.62	32.58	1.00
WA 6910	MARIS HUNTSMAN/VH74521,V	60.70	51.88 ^b	33.86 ^a	.50
WA 6819	CJP CLUB/SPRAGUE	59.79	54.07	31.00	.00
OR 7996	HYS/YAYLA//WA4995/3/CERC	59.79	52.60	33.46	.50
CI754022	RDL/SU92/KALIAN/BB	59.73	51.85 ^b	29.04	.50
OR 8188	HYS/NORCO//CAMA//SM4,A13	58.38	51.57 ^b	31.59	.50
CI 17909	LEWJAIN	58.26	54.93	30.51	.00
WA 7163	VPM/MOS951112*OR68007	57.68	52.83	32.28	.50
CI 13740	MORO	57.01	52.58	38.48 ^a	.25
ORCW8113	SPN//63189-66-71/BEZ	55.50	52.85	32.09	1.25
WA 7074	NORCO/VH72297,VH080717	54.99	52.28 ^b	33.37	.50
CI765784	ROMANIA FONDEA 12-71/JUP	53.93	55.88	29.23	1.00
WA 7168	VB 72277,WA1996/VH6647/	52.65	51.32 ^b	30.71	.00
CI 13968	NUGAINES	52.30	55.32	29.82	.25
WA 7165	VPM/MOS421//2*RAEDER	51.78	53.18	29.63	.25
OR 835	1523 DRC/RBS	51.35	49.57 ^b	29.82	2.25
CI 17596	STEPHENS	50.96	51.25 ^b	32.18	.75
CI 17926	PHOENIX,WW33	48.99	57.60 ^a	29.92	.25
WA 7169	VH 74340,CI14484/66344//	47.94	51.07 ^b	31.20	2.50
CI 11755	ELGIN	47.55	52.30 ^b	38.78 ^a	1.50
CI 17773	TYEE	47.31	50.10 ^b	31.99	.50
CI 1442	KHARKOF	41.90 ^b	54.02	43.41 ^a	2.00
WA 7170	55-1744/7C//SU/RDL	40.24 ^b	51.18 ^b	34.06 ^a	22.50 ^a
	X	57.23	53.24	32.53	1.51
	F 3/	4.87**	25.99	.41	.24
	S.E.X.	4.34	.87	1.09	1.00
	C.V. X	7.58	1.63	3.34	66.27
	L.S.D.	12.18	2.43	3.05	2.88

1/ Check variety

2/ % TCK smut (*Tilletia controversa* kuhn) Ocular observation

3/ F value for variety comparison

Table 5 Offstation winter wheat yields from three locations in western Montana in 1984

STATE or CI #	VARIETY	1/ CLASS	LAKE COUNTY			SANDERS COUNTY			
			YIELD BU/A	TEST WT LBS/BU	HEIGHT INCHES	YIELD BU/A	TEST WT LBS/BU	HEIGHT INCHES	
OR 792	TRIUMPH/LANCER	R	66.66	58.10	36.75	35.54	50.12	30.41	
CI 17909	LEWJAIN	W	66.63	57.40	34.25	32.44	48.22	24.31	
CI 17773	TYEE	W	66.05	55.15	36.00	28.10	43.83	24.11	
WA 7049	LIND SEL B	R	64.44	55.75	36.00	33.80	50.23	27.56	
OR 68007	HILL 81	W	63.34	55.82	37.13	32.98	46.05	28.74	
MT 77077	WINRIDGE	R	60.33	57.07	37.00	35.41	50.30	24.31	
CI 14586	LUKE	W	59.51	57.20	31.50	27.81	48.90	22.64	
CI 11727	WESTON	R	59.07	59.63	37.50	28.10	48.85	31.00	
ID 3518	WA4765/3/BEZ//BURT	R	58.13	56.02	33.25	26.48	49.28	22.74	
CI 17596	STEPHENS	W	56.75	56.68	34.00	34.24	48.60	23.62	
WA 6820	GWB,127,GWB236,//G	R	55.41	57.08	32.00	34.48	44.75	28.15	
ORC 8113	SPN//63189-66-71-7	W	54.93	55.98	33.75	27.91	45.18	25.00	
CI 17590	FARD	W	53.88	54.97	32.75	28.79	43.95	25.10	
CI 17149	DAWS	W	52.56	57.80	35.00	30.24	46.15	25.00	
WA 6696	DAWS/WA5829 VH 079	W	47.06	58.43	35.50	32.82	47.95	26.67	
NA 234	HAWK	R	45.13	58.25	35.50	33.86	47.93	25.69	
			X	58.12	56.96	34.87	31.44	47.52	25.94
			F 2/	1.87	7.19	1.23	1.51	12.89**	3.84**
			S.E.X.	4.79	.48	1.69	2.55	.62	1.31
			C.V. Z	8.24	.85	4.84	8.12	1.30	5.06
			L.S.D.	13.64	1.37	4.80	7.27	1.76	3.74

STATE or CI #	VARIETY	1/ CLASS	RIVALI COUNTY			3 LOCATION MEAN			
			YIELD BU/A	TEST WT LBS/BU	HEIGHT INCHES	YIELD BU/A	TEST WT LBS/BU	HEIGHT INCHES	
OR 792	TRIUMPH/LANCER	R	49.01	58.55	32.28	50.34	55.59	33.15	
CI 17909	LEWJAIN	W	44.58	57.73	27.36	47.88	54.45	28.64	
CI 17773	TYEE	W	32.15	53.05	24.11	42.10	50.68	28.07	
WA 7049	LIND SEL B	R	40.06	56.85	26.87	46.10	54.28	30.14	
OR 68007	HILL 81	W	42.85	55.27	31.79	46.39	52.38	32.55	
MT 77077	WINRIDGE	R	42.68	58.18	29.92	46.14	55.18	30.41	
CI 14586	LUKE	W	41.66	57.40	26.28	42.99	54.40	26.81	
CI 11727	WESTON	R	38.65	60.72	37.01	41.94	56.40	35.17	
ID 3518	WA4765/3/BEZ//BURT	R	33.86	54.35	26.28	39.49	53.22	27.42	
CI 17596	STEPHENS	W	31.73	55.32	26.18	40.91	53.53	27.93	
WA 6820	GWB,127,GWB236,//G	R	44.58	57.73	27.36	44.82	53.19	29.17	
ORC 8113	SPN//63189-66-71-7	W	32.59	56.37	27.26	38.48	52.51	28.67	
CI 17590	FARD	W	41.43	53.18	28.64	41.37	50.70	28.83	
CI 17149	DAWS	W	39.45	56.68	26.18	40.75	53.54	28.73	
WA 6696	DAWS/WA5829 VH 079	W	46.33	58.57	30.22	42.07	55.00	30.80	
NA 234	HAWK	R	47.00	60.13	34.74	42.00	55.44	31.98	
			X	40.53	56.86	29.16			
			F 2/	1.65	24.98**	15.43**			
			S.E.X.	4.27	.44	.90			
			C.V. Z	10.54	.78	3.10			
			L.S.D.	12.16	1.27	2.57			

1/ Class = type of winter wheat, R = red, W = white

2/ F value for variety comparison