

DRYLAND WINTER GRAIN

Wheat

The interstate winter wheat nursery seeded at Creston consisted of seventeen entries. All were hard red winters except 27-15 x Rex-Rio-41 which is a bread type white wheat. Moisture conditions were very good. Ice which formed during January reduced the yield of much of the wheat, but had no effect on the station material. To control weeds this nursery was cultivated once and hand weeded to remove weeds within the row.

Drawf bunt was moderate to severe in this nursery. Newturk and Yogo-Rescue 66-22 were the varieties with the highest rate of infection. Wasatch had traces of bunt. C.I. 12696 was the highest yielding variety with 74.2 bushels per acre and free of drawf bunt. C.I. 12933 was next in yield followed by 12930. These are of the drawf bunt resistant varieties, of these, C.I. 12933 showed 0.1% drawf bunt this year. Lodging was moderate in the Yogo-Rescue crosses and in some of the older varieties. No lodging was noted in C. I. 12933, 12930 and C. I. 12696. The mean yield of this nursery was 65.5 bushels per acre. Table XXXV.

Twenty entries were grown in the Uniform Western Regional Hard Red winter nursery. This was seeded very late in the season, Oct. 17, 1955. Emergence was poor due to dry conditions in the area. Winter killing was severe in the less hardy varieties due to the lack of snow cover.

There was no evidence of drawf bunt in this nursery. Stands were poor in most varieties. This nursery tested the winter hardness of these varieties. C. I. 12696 was poorest in stand (7%), and lowest in yield (2.3). C. I. 12806 was best in stand (90%) and highest in yield (17.0). Because of erratic stands a high C. V. was obtained. Wasatch, the check variety was low in yield 6.4 bushel per acre and a stand of 33%. C.I. 12930 and 12933 were 53 and 72% in stand respectively. However the difference of yield of these two varieties was not significant. Table XXXVI.

To study a large selection of crosses of Yogo-Turkey/oro 221 a single row three replicated nursery was seeded. There were 163 entries in this nursery. Only a portion of them were harvested. Many being eliminated because of poor characteristics. Lodging was severe in this nursery, but no notes were taken for comparisons. Drawf bunt was noted in several of the varieties. The mean of this nursery was 53.5 bushels per acre. No one variety can be selected at this time for high yielding ability.

Planting dates of winter wheat have been a question in Northwestern Montana for many years. To determine the optimum date a study was begun in the fall of 1955. Two varieties were used in this study. See Table XXXVII a. One years data shows that Sept. 24 was the best planting date in 1955, and 12930 was the highest yielding variety. Table XXXVIIb.

Table XXXVI. Agronomic data from Uniform hard red winter wheat nursery grown in Flathead county on the Conrad Gilbertson farm in the Stillwater area, Kalispell, Montana in 1955-56. Single row plots four replications.

Date Seeded. October 17, 1955 Date Harvested. August 23, 1956 Size of Plot. 16 feet

Variety or Cross	C. I. or N No.	Height in Inches	Stand Per- cent	Plot Yield			Total Bushel	Average Bushels Per Acre
				I	II	III		
Minturki x Tim/Vaulgare ²	12806	27	90	21.3	17.0	13.5	51.8	17.3**
Yogo x Rescue	56-30	24	40	16.3	12.8	10.6	39.7	13.2*
H44 x Minturki ⁴	Minn 2844	27	58	17.7	15.6	11.3	44.6	14.9**
Kharkof	1442	25	70	17.0	19.1	14.9	51.0	17.0**
Yogo	8003	26	68	19.9	8.5	19.1	47.5	15.8**
Wasatch	11925	25	33	5.7	9.2	4.3	19.2	6.4
Blackhull/Rex x Cheyenne	12933	23	72	9.2	19.9	12.8	41.9	14.0**
Kiowa	12133	21	44	8.5	8.5	9.2	26.2	8.7
Blackhull/Rex x Rio/Rex	12932	24	65	8.5	15.6	11.3	35.4	11.8*
Rio	10061	24	67	13.5	17.0	10.6	41.1	13.7**
Rio/Rex x Nebred (Columbia)	12928	21	68	15.6	17.7	11.3	44.6	14.9**
Rio/Rex x Nebred	12930	20	53	13.5	14.2	7.1	34.8	11.6*
Orfed x Wasatch	12943	22	47	14.2	16.3	12.1	42.6	14.2**
175a - 53 Utah		21	55	7.8	9.9	10.6	28.3	9.4
175a - 55 Utah		23	32	9.2	7.1	11.3	27.6	9.2
Rio/Rex x Nebred	12929	23	32	9.2	12.1	6.4	27.7	9.2
Cheifkan x Mt/Tg	160-49-A-13	23	30	5.7	2.1	5.1	12.9	4.3
Commanche x C. I. 12250		20	35	3.5	8.5	7.1	19.1	6.4
Kharkof-17-7		27	60	13.5	18.4	8.5	40.4	13.5**
27-15 x Rex/Rio - 41	12696	18	7	9.0	3.5	3.5	7.0	2.3

Note: Wasatch is used as a check in this nursery.
 *Varieties yielding significantly more than the check (5%).
 **Varieties yielding significantly more than the check (1%).

Mean Yield.....11.4
 S. E. \bar{x}1.8152
 L.S.D. (5%).....5.2
 L.S.D. (1%).....6.9
 C. V.15.92%

Analysis of Variance

Source	D. F.	Mean Square	F
Replications	2	34.472	3.49
Varieties	19	53.7597	5.44
Error	38	9.88516	

Table XXXVII. Yield data from Yogo x Turkey/oro-221 F₂ derived lines in winter hardiness and smut nurseries.

1955-56 Plots No. Replication # 1	Plot Yield in Ounces			Total Ounces	Average Bu/Acre
	I	II	III		
5	22.50	25.50	19.00	67.00	63.3
8			15.50	15.50	42.5
9	24.00	25.00	13.50	62.50	59.1
10	19.75		18.50	38.25	54.2
11	18.00		16.25	34.25	48.6
12	22.75	18.00	13.25	54.00	51.1
13	22.25		16.00	38.25	54.2
14	25.75	16.50	16.00	58.25	55.1
15	13.75		14.50	28.25	40.1
16	27.25		15.00	42.25	59.9
17	20.25	22.00	22.00	64.25	60.7
18	20.00	23.00	16.50	59.50	56.3
19	18.25	19.75	16.00	54.00	51.1
20	19.75		15.75	35.50	50.3
21	21.75		14.50	36.25	51.4
22	20.50	20.75	19.75	61.00	57.7
23	21.25	26.00	16.00	63.25	59.8
24	20.75	21.50	21.75	64.00	60.5
25	27.50		19.00	46.50	65.9
26			13.00	13.00	36.8
27	23.00		15.00	38.00	53.9
28	22.50		16.50	39.00	55.3
29	17.00	19.00	14.25	50.25	47.5
30	25.25		19.00	44.25	62.7
31	20.00	18.00	13.00	51.00	48.2
32	19.50		16.00	35.50	50.3
33	27.00		16.25	43.25	61.3
34	24.00		23.75	47.75	67.7
35	21.50		14.25	35.75	50.7
36			16.00	16.00	45.4
37	22.75		12.00	34.75	49.3
38	21.00	21.00	19.00	61.00	57.7
39	20.00	20.00	17.00	57.00	53.9
40			13.75	13.75	39.0
41		16.75	20.75	37.50	53.2
43	24.50		15.00	39.50	56.0
45	22.75	20.50	18.00	61.25	57.9
46	19.75	22.50	12.75	55.00	52.0
48			14.50	14.50	41.1
53		16.75	18.00	34.75	49.3
57		21.00	15.25	36.25	51.4
60	20.00		13.00	33.00	46.8
63	23.50	28.25	17.75	69.50	65.7
66			18.75	18.75	53.2
68	18.00	17.75	17.00	52.75	49.9

Table XXXVII. (Continued) Yield data from Yogo x Turkey/oro-221 F₂ derived lines in winter hardiness and smut nurseries.

1955-56 Plots No. Replication #1	Plot Yield in Ounces			Total Ounces	Average Bu/Acre
	I	II	III		
70	20.25	20.25	19.25	59.75	56.5
71	14.25			14.25	43.2
72		21.50	15.50	37.00	52.5
73	14.50	26.25	16.00	56.75	53.5
74		27.50	18.00	45.50	64.5
76	19.50		15.50	35.00	49.6
78	16.00		14.50	30.50	43.3
79			18.75	18.75	53.2
81		21.50	12.25	33.75	47.9
83	19.25		18.50	37.75	53.5
85			14.25	14.25	40.4
88		24.25	17.50	41.75	59.2
89			13.25	13.25	37.6
90	18.00		18.25	36.25	51.4
91	20.50		23.50	44.00	62.4
92	18.00	19.50	23.00	60.50	57.2
93		24.00	19.00	43.00	61.0
94	17.75		14.25	32.00	45.4
95	16.75	20.00	16.75	53.50	50.6
99		25.75	14.50	40.25	57.1
103			20.00	20.00	56.7
106		17.75	17.50	35.25	50.0
107			24.00	24.00	68.1
109			18.00	18.00	51.1
111		25.75	20.25	46.00	65.2
112		26.00	12.50	38.50	54.6
115			21.50	21.50	61.0
117	21.00		18.00	39.00	55.3
119	20.00	18.00	17.25	55.25	52.2
121	19.75	23.50	17.50	60.75	57.4

Mean Yield.....53.5

Table XXXVIIa. Agronomic data from Date of Planting Study with winter wheat, three dates, two varieties, four row plots and four replications. Plot size 16 feet.

Repli- cation	Date	Variety		Sum	Total
		Wasatch	12930		
I	Sept. 14	56.0	73.0	129.0	396.0
	Sept. 24	67.3	70.2	137.5	
	Oct. 4	65.0	64.5	129.5	
II	Sept. 14	66.6	60.2	126.8	360.7
	Sept. 24	63.1	64.5	127.6	
	Oct. 4	40.4	65.9	106.3	
III	Sept. 14	52.5	59.6	112.1	344.5
	Sept. 24	56.0	65.2	121.2	
	Oct. 4	53.1	58.1	111.2	
IV	Sept. 14	69.5	48.2	117.7	343.8
	Sept. 24	50.3	73.0	123.3	
	Oct. 4	59.6	43.2	102.8	
Sum		699.4	745.6	1445.0	1445.0

Table XXXVII b.

Date of Seeding	Wasatch	12930	Sum	Average
September 14	244.6	241.0	485.6	60.7
September 24	236.7	272.9	509.6	63.7
October 4	218.1	231.7	449.8	56.2
Sum	699.4	745.6	1445.0	
Average	58.3	62.1		

Analysis of Variance

<u>Variation due to</u>	<u>D.F.</u>	<u>Sum of Square</u>	<u>Mean Square</u>	<u>o- F</u>
Replication	3	266.43	88.81	4.54
Dates	2	194.01	97.005	4.96
Error a	6	117.38	19.563	
Main Plots	11	577.82		
Varieties	1	56.54	56.54	
Variety and Date	2	132.01	66.005	
Error b	9	1005.86	111.762	
Total	23	1772.23		

DRYLAND WINTER WHEAT

Six off-station nurseries were seeded in six Western Montana counties. These counties will be listed with each Table. These nurseries consisted of nine entries, all hard red except C. I. 12696. Seeding was done in single row plot 18 feet long and four replications.

The location of the nursery in Lake county was poor, being in a low place. Because of this condition two replications were quite poor and low in yield. Results thus obtained were not significant when analysed statistically. Drawf bunt was very bad in non-resistant varieties. A trace was found in C. I. 12930, but none in Wasatch or C.I. 12933. Stands were good to fair with C. I. 12696 being the poorest. Table XXXVIII.

The low coefficient of variability indicated good data were obtained from the nursery in Missoula County. C. I. 12930 was significantly better in yield than Wasatch at the 1% level as was Columbia. However the difference between Columbia and C. I. 12930 was not significant. C. I. 12696 was poorest in Stand with 72%. Drawf bunt was found only in Newturk and Yogo. Table XXXIX.

The seed bed in Lincoln county was very dry. However spring survival was fair. Yields did not vary among varieties but stands varied considerably. Yogo and Columbia wer high in yield with 19.2 bushels per acre. No drawf bunt was found in the nursery. The mean yield was 15.5 but results were not significant. Table XL.

As in past trials in Ravalli county, Newturk was the high yielding variety again in 1956, with 34.6 bushel per acre. No drawf bunt was found in this nursery. C. I. 12930 was second in yield. It was equal in stand to Newturk and there was no lodging as compared to ten per-cent in Newturk. Table XLI.

Table XXXVIII. Agronomic data from dryland winter wheat nursery grown in Lake County on the Walter Mangle Farm, Polson, Montana in 1955-56. Single row plot four replications.

Date Planted. September 24, 1955 Date Harvested. August 8, 1956 Size of Plot 16 feet.

Variety or Cross	C. I. or N No.	Stand in %	Drawf Bunt %	Heading Height in Ins.	Plot Yield In Bushels Per Acre				Total Bushel	Average Bushel Per Acre	Bushel Wt. in Pounds
					I	II	III	IV			
Wasatch	11925	78	-	44	48.2	38.2	7.1	9.9	103.5	25.8	61
Yogo	8033	84	15.0	38	48.9	54.6	8.5	6.4	118.4	29.6	61
Kharkof 17-7		80	T	40	48.2	39.0	19.1	9.2	115.5	28.9	60
Columbia	12928	81	-	30	49.6	41.1	5.7	8.5	104.9	26.2	62
Newturk		69	15.0	38	48.9	45.4	9.2	6.4	109.9	27.5	61
Blackhull-Rex x Cheyenne (M482296)	12933	85	-	39	45.4	44.0	33.3	8.5	131.2	32.8	61
Blackhull-Rex x Rio-Rex (M482271)	12932	71	.33	36	38.3	36.9	6.4	6.4	88.0	22.0	-
27-15 Rex-Rio-41	12696	60	-	31	37.6	35.4	7.1	7.8	87.9	22.0	59
Rio-Rex x Nebred (M482235)	12930	84	T	37	39.7	48.2	29.1	12.8	129.8	32.5	62

Note: Wasatch is used as a check in this nursery.

Mean Yield.....27.5
 S. E. \bar{x}3.1811
 L.S.D. (5%).....N. S.
 C. V.13.86%

Analysis of Variance

Source	D. F.	Mean Square	F
Replications	3	3228.03	79.74**
Varieties	8	58.493	
Error	24	40.477	
Total	35		

Table XXXIX. Agronomic data from dryland winter wheat nursery grown in Missoula County on the William Lucier, farm Frenchtown, Montana in 1955-56. Single row plots four replications.

Date Planted. September 16, 1955 Date Harvested. August 8, 1956 Size of Plot. 16 feet

Variety or Cross	C. I. or N No.	Stand in %	Drawf Bunt %	Heading Height in Ins.	Plot Yield In Bushels Per Acre				Total Bushel	Average Bushel Per Acre	Bushel Wt. in Pounds
					I	II	III	IV			
Wasatch	11925	79	-	38	36.9	22.7	36.9	34.0	130.5	32.6	60
Yogo	8033	86	10	37	41.1	42.5	42.5	35.5	161.6	40.4*	57
Kharkof 17-7		82	-	37	32.6	25.5	38.3	32.6	129.0	32.3	58
Columbia	12928	90	-	31	51.8	42.5	41.8	49.6	185.7	46.4**	58
Newturk		80	9	35	36.9	35.4	42.5	32.6	147.4	36.8	59
Blackhull-Rex x Cheyenne (M482296)	12933	74	-	33	41.1	39.0	34.7	31.9	146.7	36.7	59
Blackhull-Rex x Rio-Rex (M482271)	12932	79	-	34	44.0	35.4	43.2	39.7	162.3	40.6*	57
27-15 Rex-Rio-41	12696	72	-	30	24.8	32.6	26.2	27.7	111.3	27.8	57
Rio-Rex x Nebred (M482235)	12930	87	-	30	50.3	44.7	43.6	44.0	182.6	45.7**	60

Note: Wasatch is used as a check in this nursery.

*Varieties yielding significantly more than the check (5%).

**Varieties yielding significantly more than the check (1%).

Analysis of Variance				Mean Yield....37.7
Source	D. F.	Mean Square	F	S. E. X.....2.049
Replications	3	37.557	2.24	L.S.D.(5%)....6.0
Varieties	8	157.581	9.38**	L.S.D.(1%)....8.1
Error	24	16.796		C. V.5.44%
Total	35			

Table XL . Agronomic data from Dryland winter wheat nursery grown in Lincoln County on the Carl Lundeen farm, Eureka, Montana in 1955-56. Single row plots four replications.

Date Planted. September 29, 1955 Date Harvested. August 24, 1956 Size of Plot. 16 feet.

Variety or Cross	C. I. or N No.	Stand in %	Drawf Bunt %	Heading Height in Ins.	Plot Yield In Bushels Per Acre				Total Bushel	Average Bushel Per Acre
					I	II	III	IV		
Wasatch	11925	63	-	30	15.6	15.6	13.5	9.9	54.6	13.7
Yogo	8033	65	-	28	26.2	17.0	13.5	19.9	76.6	19.2
Kharkof 17-7		60	-	28	16.3	11.3	13.5	17.7	58.8	14.7
Columbia	12928	81	-	24	13.5	25.5	17.0	20.6	76.6	19.2
Newturk		65	-	25	14.2	15.6	15.6	19.9	65.3	16.3
Blackhull-Rex x Cheyenne (M482296)	12933	52	-	25	14.9	13.5	8.5	13.5	50.4	12.6
Blackhull-Rex x Rio-Rex (M482271)	12932	68	-	26	14.2	14.2	14.9	14.9	58.2	14.6
27-15 Rex-Rio-41	12696	48	-	25	20.6	12.8	12.1	10.6	56.1	14.0
Rio-Rex x Nebred (M482235)	12930	46	-	25	20.6	16.3	12.1	12.8	61.8	15.5

Note: Wasatch is used as a check in this nursery.

Analysis of Variance

Source	D.F.	Mean Square	F
Replications	3	23.494	1.95
Varieties	8	21.439	1.78
Error	24	12.073	
Total	35		

Mean Yield.....15.5
 S. E. \bar{x}1.7373
 L.S.D.(5%).....N. S.
 C. V.11.21%

Table XLI. Agronomic data from dryland winter wheat nursery grown in Ravalli County on the L. B. McFadgen farm, Stevensville, Montana in 1955-56. Single row plot four replications.

Date Planted. September 22, 1955 Date Harvested. September 6, 1956 Size of Plot. 16 feet

Variety or Cross	C. I. or N No.	Stand %	Lod- ging %	Height in Inches	Plot Yield In Bushels Per Acre				Total Bushel	Average Bushel Per Acre	Bushel Wt. in Pounds
					I	II	III	IV			
Wasatch	11925	96	10	34	31.9	21.3	31.2	24.1	108.5	27.1	62
Yogo	8033	84	12	29	34.7	23.4	14.2	26.2	98.5	24.6	62
Kharkof 17-7		72	12	32	31.2	21.3	22.0	24.1	98.6	24.7	61
Columbia	12928	92	2	30	26.9	14.9	25.5	30.5	97.8	24.5	63
Newturk		85	10	34	48.2	22.0	34.0	34.0	138.2	34.6	62
Blackhull-Rex x Cheyenne (M482296)	12933	95	-	31	22.7	25.5	24.1	39.7	112.0	28.0	63
Blackhull-Rex x Rio-Rex (M482271)	12932	92	20	32	26.2	29.8	26.9	22.7	105.6	26.4	62
27-15 Rex-Rio-41	12696	69	10	29	10.6	8.5	29.1	16.3	64.5	16.1	-
Rio-Rex x Nebred (M482235)	12930	86	-	29	24.1	30.5	29.8	26.9	111.3	27.8	62

Note: Wasatch is used as a check in this nursery.

Analysis of Variance

Source	D. F.	Mean Square	F
Replications	3	73.271	1.58
Varieties	8	92.742	2.00
Error	24	46.352	
Total	35		

Mean Yield.....26.0
 S. E. \bar{X}3.404
 L.S.D.(5%).....N. S.
 C. V.13.09%