

Cereal Grain Adaptation Nurseries

Cereal grains rank fourth in importance as a crop in Central Oregon, being surpassed by potatoes, alfalfa, and legume seed. It is an important crop, however, and fills a very definite need in the crop rotation.

Therefore, it is highly desirable that information is available on the most adaptable varieties from the standpoint of yield, rust resistance, lodging resistance, general disease resistance and height of plant considered separately from lodging resistance.

To test the agronomic characters of cereal grain varieties under Central Oregon conditions, three trials were established.

A dryland winter wheat varietal nursery was established at Ashwood on the ranch of Gerald Thornton. The nursery consisted of thirteen winter wheat varieties.

A spring grain varietal nursery consisting of twenty varieties each of wheat, oats, and barley was established on the Jim Klann farm at Madras.

A nursery consisting of twenty-five spring wheat varieties was established on the Stanley Brown farm at Prineville. This nursery contained varieties developed under and for irrigation farming and it was hoped that they might exhibit lodging resistance and rust resistance.

All nurseries were seeded at a rate comparable to the check variety based on kernel count. The nurseries were seeded with a V-belt type seeder.

The irrigated nurseries were replicated three times and the dryland nursery four times. Each plot consisted of three rows, twenty feet long. The plots were trimmed to 16 feet before harvest. The center row was harvested for yield estimate.

Yield and bushel weight were taken on all nurseries and the following agronomic notes were taken, depending on the nursery: days to head, days to ripe, plant height, shattering, lodging, leaf and stem rust, other diseases, glume color, kernel color, and presence of awns.

Where notes on lodging are presented in this report the notes indicate the number of replications in which lodging occurred in parentheses and the total percentage of lodging to occur. Consequently, if there was complete lodging in three replications it would be represented as (3) 300. The object of this manner of presentation is to give more complete information on the scope of lodging. Lodging, under Central Oregon conditions, is generally very erratic depending on soil moisture and fertility. It is important to know but difficult to evaluate.

In this report stem rust is divided into six categories: no rust, trace, light, medium, heavy, and very heavy infestations. In the tables they are listed as 0, T, 1, 2, 3, & 4. Varieties with either of the first three ratings are considered sufficiently resistant to rust. All rust notes were taken on the regrowth of the trimmed portion of the nursery. Some rust was evident in the Klann nursery, but only a trace in the Stanley Brown nursery.

Spring Cereals

Stanley Brown Spring Wheat Nursery

Under present conditions, the most important spring grain in Central Oregon is wheat. To expedite the search for a spring wheat variety more adaptable to conditions of irrigation and high fertility, a group of varieties developed under irrigation farming was supplied to the Central Oregon Experimental Area by Dr. Charles Rhode of the Pendleton Branch Station. The varieties are listed in Table No. 18.

The nursery was seeded April 25, 1953, under favorable soil and moisture conditions. The soil was quite uniform and good growing conditions existed throughout the crop season.

The following agronomic data were taken: yield, bushel weight, plant height, intensity of lodging, infestation of leaf and stem rust, glume color, kernel color, and presence of awns.

The data taken from the nursery is presented in Table No. 18.

There was no significant difference in yield between the varieties.

Although some of the Idaed x Merit x Marfed X Merit crosses were superior to Federation in rust resistance, none of them equalled or exceeded Federation in yield. On the basis of yield, the best cross was Marfed x Merit Selection 28 which yielded 95% of Federation.

Lodging in the nursery was not serious and rather spotty, and because it was spotty, probably not reliable.

With the exception of rust resistance, it probably can be said that no variety was superior to Federation in yield or other agronomic characteristics. All varieties were too tall to be ideal varieties under irrigation.

James Klann Spring Cereal Nursery

The nursery consisted of twenty varieties each of spring wheat, oats, and barley. The nursery area had been in ladino clover the three previous years.

Prior to seeding, 100 pounds of N. applied as Uyramon had been mixed in the soil with a Graham-Home plow.

The nursery was seeded March 23, 1953, under favorable soil and moisture conditions. Just before the area was to have the second irrigation in early July, the main canal of the irrigation district washed out. By the time water could be spared to irrigate the field in which the nursery was located, the grain was too far close to maturity.

The following agronomic data was from the Klann nursery: days to head, days to ripe, plant height, lodging, diseases, bushel weight, and yield.

Table No. 18
Yield & Agronomic Data for Spring Wheat Varieties Grown in Crook County - 1953
Stanley Brown Farm
Prineville, Oregon

Variety	Pedi- gree	Plant Ht. inches	(U) Lodging	(V) Leaf & Stem Rust	(X) Glume Color	(Y) Kernel Color	(Z) Awns	Bu. Wt.	Yield Bu./A.	% Fed.
Federation	4734	49	(1) WS	4	B	W	-	61.0	74.1	100.0
Lemhi	11415	49	(1) WS	4	W	W	-	60.0	62.3	84.1
Marfed	11916	46	(1) WS	4	W	W	-	62.0	67.5	91.1
Idaed X Merit Sel. 15		42	(2) 30	T	W	W	X	61.5	67.9	91.6
Idaed X Merit Sel. 5	13055	45	(3) 5	3	W	X	X	60.5	69.5	93.8
Logan No. W5-90		48	0	2	W	W	-	60.0	57.4	77.5
Marfed X Merit Sel. 10	13056	43	(1) WS	3	W	W	-	61.0	66.2	89.3
Marfed X Merit Sel. 28	13058	45	(3) 5	1	W	W	X	62.0	70.2	94.7
Kenya X Lemhi ² 50-13405	12948	48	(2) 10	2	W	W	-	61.0	77.7	104.9
Lemhi X Hope-Fed. Log. No. W5-67	13053	48	(1) 5	2	B	W	-	58.5	69.9	94.3
Kenya X Onas-I Dicklow 50-13629		49	(3) 10	4	W	W	-	59.0	74.1	100.0
Kenya X Lemhi ² 50-13449	12948	47	(3) 30	4	W	W	-	59.0	75.4	101.8
Kenya X Lemhi ² 50-13493		49	(2) 5	4	W	W	-	59.0	71.9	97.0
Kenya X Lemhi ² 50-13264		45	(3) 5	4	W	W	-	59.0	62.3	84.1
Kenya X Lemhi ² 50-13749		47	(3) 5	4	W	W	-	60.0	70.8	95.5
Kenya X Lemhi ² 50-13596		47	(3) 10	4	W	W	-	59.0	69.9	94.3
Kenya X Lemhi ⁴ 50-13697		48	(3) 5	4	W	W	-	59.0	66.5	89.7
Kenya X Lemhi ² 50-13152		46	(1) WS	4	W	W	-	60.0	68.7	92.7
Kenya X Lemhi ² 50-13612		44	(2) 5	4	W	W	-	59.0	66.8	90.1
Kenya X Lemhi ² 50-13311	12947	45	(2) 20	4	W	W	-	57.0	71.9	97.0
Kenya X Lemhi ² 50-13553		47	(2) 5	4	W	W	-	59.0	66.3	89.5
Kenya X Lemhi ² 50-13364		46	(2) 10	4	W	W	-	59.0	67.0	90.4
Kenya X Lemhi ² 50-13465		50	(1) WS	4	W	W	-	61.0	71.1	96.0
Idaed X Merit Sel. 2	13054	44	(1) WS	0	W	W	X	62.0	65.5	88.4
Marfed X Merit Sel. 22	13057	52	(3) 10	2	W	W	X	62.0	68.8	92.8

(U) Number in parenthesis indicates number of replications in which lodging occurred. Number not parenthesized indicates total lodging to occur in the 3 replicates. Complete lodging would be represented by 300.

(V) Stem Rust
0 - No rust
T - Trace
1 - light rust
2 - medium rust
3 - heavy rust
4 - very heavy rust

(X) Glume Color
W - White glumes
B - Brown glumes

(Y) Kernel Color
W - White kernels
(Z) Awns
X - Awns present
- - Awns absent

Spring Wheat

Yield and agronomic data for the James Klann Spring Wheat Varietal nursery is presented in Table No. 19.

No variety was significantly higher yielding than Federation. Baart, Baart 46, Marfed x Merit Selections 15, 22, 35, and 38 yielded significantly less than Federation at the 5% level. Onas x Pusa Selection 427 might also be considered as yielding less than Federation in this nursery.

(Hd. Fed. x Dick) x Baart x Redit x Gracieum was the highest yielding variety in the nursery with 109.3% of Federation. This variety is short to medium in height, does not have any appreciable rust resistance, and under the nursery conditions of 1953 was slightly poorer than Federation in lodging resistance. It is early to mid season in maturity. The kernel color is white. The lemmas are white and have short awns. In bushel weight it is comparable to Federation.

Other varieties with a yield greater than Federation were Orfed and Onas 41. Onas x Dicklow equalled the yield of Federation.

Only Henry, Idaed x Merit Sel 2, and Marfed x Merit Selections 22 and 35 indicated sufficient rust resistance. From the notes taken on lodging (Table No. 19) it would appear that Baart, Baart 46, Lemhi, Cascade, and Henry are more lodging susceptible than is Federation. The crosses listed having Merit as one parent have apparently a good degree of lodging resistance. Perhaps this is associated with the harsh, wiry culms so evident in these crosses.

Table No. 20 shows the yields by year for all varieties maintained in the nursery. The data in the table indicates that from 1948-53 inclusive the following varieties have equalled or exceeded the yield of Federation for more than one year: Lemhi 104.9%, Marfed 103.6%, Onas 41 - 103.8%, Onas x Dicklow 102.7%, Orfed 104.4%, Federation 41 - 103.8%, and Hd. Fed x Redit x Gracieum Sel. 1 - 107.1%.

Table No. 21 lists the varieties discarded from the spring wheat nurseries from the period of 1948-53 inclusive. The varieties were discarded principally from the standpoint of lower yield.

Spring Oats

The spring oat varieties grown in the James Klann spring grain varietal trial, Table No. 22 indicates that only six varieties did not significantly exceed the yield of Victory during the 1953 season. Actually, the analysis of variance has told us only that the late varieties were severely injured by the lack of proper irrigation during the previously mentioned ditch break. Conversely, the early maturing varieties yielded relatively greater than the late maturing check.

The varieties which were apparently the highest yielding in the nursery were Overland, (VxR) x Bannock 3865, (VxR) x Bannock 4173 and Clinton x Overland² 46 AB, 5983.

Lodging was quite severe in the nursery; those varieties which appeared to have the most resistance to lodging were crosses including Clinton and Andrew. Of the (VxR) x Bannock Crosses Overland and Cody appeared to have more resistance than 4173 and 3865.

Table No. 19
Yield & Agronomic Data for Spring Wheat Varieties Grown in Jefferson County
James Klann Farm 1953 Madras, Oregon

Variety	Pedi- gree	Days to Head	Days to Ripe	Plant Ht. Inches	(X) Lodging	(Y) Diseases	Bu. Wt.	Yield Bu./A.	% Fed.
Federation	4734	104	153	45.7	(1) 20	3	61.0	47.3	100.0
Onas X Dicklow	12228	104	151	43.7	(1) 40	3	61.0	47.3	100.0
Lemhi	11415	104	149	42.0	(2) 65	4	60.5	45.0	95.1
Orfed	11913	106	155	48.3	0	3	63.0	51.1	108.0
Federation 41	12230	104	151	43.0	(1) 20	3	61.0	43.9	92.8
Marfed	11916	104	152	41.7	(2) 25	3	62.0	43.5	92.0
Baart	1697	102	151	44.3	(3) 105	3	61.0	36.4	77.0
Onas 41	12229	102	151	42.0	(1) 30	4	61.0	49.9	105.5
Cascade	12376	101	153	48.7	(1) 60	2	61.0	44.4	93.9
Hard Federation	8255	99	150	34.3	0	3	62.0	39.9	84.4
Awned Onas	12235	99	150	41.7	(2) 25	3	60.5	47.1	99.6
Idaed X Merit	Sel.2	102	149	42.3	(1) 5	1	60.0	42.5	89.9
Marfed X Merit	Sel.15	101	151	38.0	(1) 30	2	58.5	24.7	52.2
Marfed X Merit	Sel.22	103	149	38.7	0	1	60.0	25.8	54.5
Marfed X Merit	Sel.35	103	151	42.0	(1) 10	1	61.0	34.7	73.4
Marfed X Merit	Sel.38	100	149	40.7	0	2	58.5	23.6	50.0
Onas X Pusa	Sel.427	98	149	38.7	(2) 26	3	60.0	37.1	78.4
Baart 46	12385	100	152	44.7	(2) 90	2	60.5	36.3	76.7
Henry		100	148	42.7	(3) 55	T	60.5	43.0	90.9
(Hd. Fed. X Dick) X Baart X Ridit X Graceium	Sel.1	101	151	39.3	(2) 32	3	61.5	51.7	109.3

L.S.D. @ .05 10.4 Coefficient of Variation 15.5%

(X) Number in parenthesis indicates number of replications in which lodging occurred. Number not parenthesized indicates total lodging to occur in three replications. Complete lodging would be represented by 300.

(Y) Stem rust

0 = no rust

T = trace

1 = light infestation

2 = medium infestation

3 = heavy infestation

4 = very heavy infestation

No shattering occurred at harvest.

Table No. 20
 Spring Wheat Varieties Grown in Spring Grain Varietal Nurseries
 During Years 1948-53 Inclusive. Table Shows Yield of Variety
 in Bushels per Acre for Years Grown and in Percentage of Federation

Variety	Pedi- gree	Yield in Bushels Per Acre						Mean	%	No.	Years Grown
		1948	1949	1950	1951	1952	1953				
Federation	4734	30.9	30.9	30.6	48.2	31.1	60.7	38.7	100.0	14	6
Iemhi	11415	31.0	34.7	31.0	54.5	38.7	53.7	40.6	104.9	14	6
Marfed	11916	33.9	40.9	29.2	43.8	37.4	55.5	40.1	103.6	14	6
Federation	4734	30.9	30.9	30.6	48.2	31.1	47.3	36.5	100.0	13	6
Cnas 41	12229	31.7	36.4	29.5	48.5	31.5	49.9	37.9	103.8	13	6
Cnas X Dicklow	12228	29.9	34.8	31.6	54.5	26.9	47.3	37.5	102.7	13	6
Crfed	11913	34.7	31.8	32.0	42.1	37.0	51.1	38.1	104.4	13	6
Federation 41	12230	33.5	39.5	30.6	48.7	31.3	43.9	37.9	103.8	13	6
Laart	1697	26.8	35.9	32.0	38.9	29.0	36.4	33.2	91.0	12	6
Federation	4734		30.9	30.6	48.2	31.1	47.3	37.6	100.0	10	5
Cascade	12374		33.4	27.9	40.2	38.0	44.4	36.8	97.9	10	5
Federation	4734		30.9		48.2	31.1	47.3	39.4	100.0	7	4
Hard Federation 31	8255		27.0		36.5	30.8	39.9	33.3	84.5	7	4
Federation	4734			30.6	48.2	31.1	60.7	42.7	100.0	8	4
Idaed X Merit (Sel.2)	13054			27.5	40.3	30.9	54.0	38.2	89.5	8	4
Marfed X Merit (Sel.22)	13057			25.0	40.1	38.7	47.3	37.8	88.5	8	4
Federation	4734			30.6	48.2	31.1	47.3	39.3	100.0	7	4
Awmed Onas	12235			27.8	42.9	33.2	47.1	37.8	96.2	7	4
Marfed X Merit (Sel.35)				33.3	33.8	36.2	34.7	34.5	87.8	6	4
Marfed X Merit (Sel.15)				25.9	41.4	33.5	24.7	31.4	79.9	7	4
Marfed X Merit (Sel.38)				21.6	45.0	37.2	23.6	31.9	81.2	7	4
(Hd. Fed. X Dicklow) X Baart X Ridit X Gracieum (Sel.1)				30.1	47.6	38.8	51.7	42.1	107.1	7	4
Cnas X Pusa (Sel.427)				22.0	40.8	25.8	37.1	31.4	79.9	7	4

Table No. 20, Continued

Variety	Pedi- gree	Yield in Bushels Per Acre						Mean	%	No. Trials	Years Grown
		1948	1949	1950	1951	1952	1953				
Federation	4734				31.1	47.3	39.2	100.0	2	2	
Baart 46	12385				32.2	36.3	34.3	87.5	2	2	
Henry					29.7	43.0	36.4	92.9	2	2	
Federation	4734					74.1	74.1	100.0	1	1	
Idaed X Merit Sel.15						67.9	67.9	91.6	1	1	
Idaed X Merit Sel.5	13055					69.5	69.5	93.8	1	1	
Logan No. W5-90	13056					57.1	57.1	77.1	1	1	
Marfed X Merit Sel.10	13058					66.2	66.2	89.3	1	1	
Marfed X Merit Sel.28	13053					70.2	70.2	94.7	1	1	
Kenya X Lemhi 50-13405	12948					77.7	77.7	104.9	1	1	
Lemhi X Hope-Federation Log. W5-67						69.9	69.9	94.3	1	1	
Kenya-Onas I X Dicklow 50-13629						74.1	74.1	100.0	1	1	
Kenya X Lemhi ⁴ 50-13697						66.5	66.5	89.7	1	1	
Kenya X Lemhi ² 50-13449	12949					75.4	75.4	101.8	1	1	
Kenya X Lemhi ² 50-13493						71.9	71.9	97.0	1	1	
Kenya X Lemhi ² 50-13264						72.3	72.3	97.6	1	1	
Kenya X Lemhi ² 50-13749						70.8	70.8	95.5	1	1	
Kenya X Lemhi ² 50-13596						69.9	69.9	94.3	1	1	
Kenya X Lemhi ² 50-13152						68.7	68.7	92.7	1	1	
Kenya X Lemhi ² 50-13612						66.8	66.8	90.1	1	1	
Kenya X Lemhi ² 50-13311	12947					71.9	71.9	97.0	1	1	
Kenya X Lemhi ² 50-13553						66.3	66.3	89.5	1	1	
Kenya X Lemhi ² 50-13364						67.0	67.0	90.4	1	1	
Kenya X Lemhi ² 50-13465						71.1	71.0	95.8	1	1	

Table No. 21

Varieties Grown and Discarded From Spring Wheat
 Varietal Nursery From Years 1948 - 1952 Inclusive

Variety	Pedigree	Yield in Bushels Per Acre 1948 - 1952 Inclusive					Mean	%	No. Trials	Years Grown
		1948	1949	1950	1951	1952				
Federation (1)	4734	30.9	30.9	30.6	48.2	31.1	36.5	100.0		
Idaed	11706	25.6	28.0				26.9	87.1	6	2
Comet	11465	29.9	29.8				29.9	96.8	6	2
White Federation 38	11906	24.1	28.0				26.1	84.5	6	2
Currowa Sel.5-1		28.9	35.5				32.2	104.2	6	2
Federation X Bunyip	11874	27.1	35.1				31.1	100.6	6	2
Thatcher	10003		22.8				22.8	73.8	3	1
Big Club	12244		29.9				29.9	96.8	3	1
Hope X Lemhi ⁴	12685			18.1			18.1	59.2	1	1
Martin X Hd.Fed. ⁶	Dav.3266			22.1			22.1	68.6	3	1
Baart 38	11907	28.1	35.5	26.2	41.5		32.8	95.6	11	4
Hope X Federation	11921	28.7	33.9	29.1	38.5		32.6	92.9	11	4

(1) Check Variety

(2) Percent of Federation for the years the variety was grown.

Table No. 22
Yield and Agronomic Data for Spring Oat Varieties Grown in Jefferson County
James Klann Farm 1953 Madras, Oregon

Variety	Pedi- gree	Days to Head	Days to Ripe	Plant Ht. Inches	Y Lodging	Z Diseases	Bu. Wt.	Yield Bu./A	% Victory
Victory	1145	107	154	58.7	(2) 125		37.5	40.3	100.0
Carleton	2378	104	150	54.0	(1) 25		36.7	88.4	219.4
(VXR) X Bannock	4173	106	152	49.7	(3) 100		37.2	101.5	251.9
Markton	2053	105	150	52.0	(3) 225		36.3	71.2	176.7
Bannock	2592	107	150	50.7	(3) 175		35.2	72.0	178.7
Magistral X Richland	4373	103	150	44.3	(1) 75		36.5	84.8	210.4
Shasta	3976	108	156	54.0	(2) 125		36.0	52.3	129.8
Overland	4181	106	151	50.0	(1) 25		38.0	102.1	253.3
(VXR) X Bannock	3865	107	150	49.0	(2) 150		35.8	101.7	252.3
Ajax	4157	104	151	57.7	(2) 75		35.3	71.6	177.7
Beaver	4521	103	150	55.0	(2) 50		36.7	91.7	227.5
Anthony X Morota	4267	104	151	51.3	(2) 75		34.7	77.7	192.8
Cody	3916	105	150	47.0	(2) 75		36.0	67.7	168.0
Clinton X Overland	6611	106	151	49.3	(1) 25		35.8	95.3	236.5
C.I. 4189 X Overland ²	5347	106	150	48.0	(2) 125		35.2	83.4	206.9
Fortune	5226	105	152	52.0	(1) 50		37.7	88.0	218.4
Andrew X Clinton	5635	102	151	50.0	(1) 25		36.3	71.7	177.9
Clinton X Overland ² 46AB	5983	105	151	51.7	(2) 50		36.8	97.3	241.4
Clinton X Overland	5346	106	152	52.0	(1) 25		36.2	92.9	230.5
Clinton X Overland	5933	104	152	51.3	(1) 25		37.7	94.8	237.2
L.S.D. @ 5%	27.2								
L.S.D. @ 1%	36.4								
Coefficient of Variation	20.0%								

(Y) Numbers in parenthesis indicate number of replications in which lodging occurred. The number not parenthesized indicates the total lodging to occur in the three replications. Complete lodging in the three replicates would be represented by 300.

(Z) No diseases were observed.
No shattering observed at harvest.

Table No. 23
 Spring Oat Varieties Grown in Spring Grain Varietal Nurseries
 During Years 1948-53 Inclusive. Table Shows Yield of Variety
 in Bushels per Acre for Years Grown and in Percentage of Victory

Variety	CI. No.	1948	1949	1950	1951	1952	1953	Mean Yield	% Victory	No. of Trials	Years Grown
Victory	1145	75.3	60.6	77.5	67.1	52.9	40.3	62.3	100	13	6
(V-R)x Bannock	4173	81.6	57.7	74.4	75.5	40.8	101.5	71.8	115.2	13	6
Markton	2053	68.1	60.6	72.9	58.4	43.0	71.2	62.4	100.2	13	6
Bannock	2592	88.8	65.7	73.9	72.7	61.0	72.0	72.3	116.1	13	6
Magistral X Richland	4373	67.9	63.5	70.8	64.5	44.5	84.8	66.0	105.9	13	6
Shasta	3976	93.7	72.8	73.5	67.2	53.7	52.3	68.9	110.6	13	6
Carleton	2378	75.1	60.0	69.7	59.5	-	88.4	70.5	109.8	12	5
Victory	1145	-	60.6	77.5	67.1	52.9	40.3	59.7	100.0	10	5
Overland	4181	-	64.8	76.8	66.8	54.1	102.1	72.9	122.1	10	5
(V-R) x Bannock	3865	-	70.0	81.3	80.3	68.1	101.7	80.3	134.5	10	5
Ajax	4157	-	59.7	72.8	62.3	39.8	71.6	62.2	104.2	10	5
Beaver	4521	-	64.4	73.4	59.2	57.4	91.7	69.2	115.9	10	5
Anthony X Morota	4267	-	69.6	84.3	63.9	66.3	77.7	72.4	121.3	10	5
Victory	1145	-	-	77.5	67.1	52.9	40.3	59.5	100.0	7	4
Cody	3916	-	-	76.4	72.3	56.2	67.7	68.1	114.5	7	4
Cl 4189 X Overland ²	5347	-	-	80.3	74.4	45.2	83.4	70.8	119.0	7	4
Fortune	5226	-	-	85.6	79.9	48.7	88.0	75.5	126.9	7	4
Victory	1145	-	-	-	-	52.9	40.3	46.6	100.0	2	2
Andrew X Clinton 46AB	5635	-	-	-	-	34.6	71.7	53.1	113.9	2	2
Clinton X Overland ²	5983	-	-	-	-	53.3	97.3	75.3	161.6	2	2
Clinton X Overland ²	5346	-	-	-	-	37.7	92.9	65.3	140.1	2	2
Clinton X Overland ²	5933	-	-	-	-	46.0	95.6	70.8	151.9	2	2
Victory	1145	-	-	-	-	-	40.3	46.6	100.0	1	1
Clinton X Overland ²	6611	-	-	-	-	-	05/3	95.3	204.5	1	1

Table No. 24
 Yield Comparisons of (VxR) x Bannock 3865 with Three Commonly Grown Varieties in
 Central Oregon for the Years 1949-53 inclusive. Yields Expressed
 in Bushels Per Acre

Variety	Pedigree	Yield in Bushels Per Acre					Mean	% Victory
		1949	1950	1951	1952	1953		
Victory	1145	60.6	77.5	67.1	52.9	40.3	59.6	100.0
Shasta	3976	72.8	73.5	67.2	53.7	52.3	63.9	107.2
Overland	4181	64.8	76.8	66.8	54.1	102.1	72.9	122.3
(VxR) x Bannock	3865	70.0	81.3	80.3	68.1	101.7	80.3	134.5

Field Comparison of (VxR) x Bannock 3865 VS Victory 1145
 on One Location in Central Oregon

Yield in Bushels Per Acre	
(VxR) x Bannock	Victory
56.6	60.0
70.6	68.6
74.0	70.0
76.0	70.3
88.3	74.0
108.9	76.0
116.6	83.3
128.3	92.3
135.6	93.9
139.3	97.9
144.3	106.3
170.6	109.9
Mean 109.1	83.5
Bu. Wt. 34.7	35.9

Table No. 25
 Varieties Grown and Discarded from Spring Oats Varietal
 Nursery from Years 1948 - 1952 Inclusive

Variety	Pedigree	1948	1949	1950	1951	1952	Mean Yield	% Victory	No. Trials	Years Grown
Victory	1145	75.3	60.6	77.5	67.1	52.9	62.3	100	12	5
D 69	4285	51.9					51.9	68.9	3	1
Clinton	3971	48.7					48.7	64.7	3	1
Kanota	839	62.8					62.8	83.4	3	1
Bridger	2611		69.7				69.7	115.0	3	1
Markton X Victory	2591		57.6				57.6	95.0	3	1
Colo. 37	1640	81.3	49.3				65.3	96.0	6	2
Marida	2571	65.2	57.9				61.6	90.6	6	2
Markton X Ligowa	3633	68.8	57.8				63.3	93.1	6	2
Shelby	4372			70.0	55.8		62.9	87.0	5	2
Bond X Iogold	4330		42.3	69.5	61.0		57.6	84.2	8	3
(V-R) X Bannock	4283	73.6	63.8	69.7	71.0		69.5	99.1	11	4
Markton X Colo. 37	4377	60.6	61.4	66.4	66.9		63.8	91.0	11	4
Kent	3909			63.2	55.3	55.8	58.1	88.3	6	3

The height of the plant could not be associated with severity of lodging.

A summary table of the spring oat varieties which are carried in the nursery and the mean yields of those varieties are presented in Table No. 23. All of the varieties presently carried in the nursery are equal to or superior to Victory oats. Of the varieties carried longer than two years, (V-R) x Bannock (3865) is the highest yielding at 134% of Victory, Fortune (5226) 127%, Overland (4181) 122%, Anthony x Morota (4267) 121%.

(V-R) x Bannock 3865 is considered a good possibility for Central Oregon. It has certain distinct advantages over Victory. 3865 is 6-12 inches shorter than Victory, 4-6 days earlier in maturing coupled with a definite increase of yield. The bushel weight of 3865 is less than Victory generally by about 2 pounds per bushel. The principal disadvantage of 3865 is that it is no better than Victory in resistance to lodging.

The kernels of 3865 are rather narrow in relation to length, yellow in color and not particularly good looking. However, the hull is thin and the groat is plump. When the grain is in good condition, the high yield and rich color appeals to the farmer.

During 1953 one field comparison of 3865 vs Victory was established on the farm of Fritz Hackler in the Metolius area. Three drill strips were interspersed in the field of Victory. Yield estimates were made by harvesting four 9 square foot samples of 3865 in each strip. For each sample of 3865 harvested, a sample of Victory was taken adjacent to the 3865 sample area. Therefore, the yield estimate was made on 12 paired comparisons. In the comparison, 3865 exceeded the yield of Victory by 25.6 bushels per acre. The bushel weight of Victory exceeded 3865 by 1.2 pounds per bushel.

The results of this field comparison are shown in Table No. 24 along with a comparison of 3865 with more commonly grown varieties.

Table No. 25 shows the oat varieties discarded from the nursery between the years 1948-1953. The yields of the varieties as means and as percentages of Victory are shown. The varieties discarded admittedly did not receive adequate testing but were dropped to make room for more promising varieties.

Spring Barley

Yield and agronomic information taken from the spring barley nursery on the James Klann farm are presented in Table No. 26.

The barley in this nursery definitely shows the effect of having been short on water during the time the grain was forming in the head. As a result the only variety which yielded significantly higher than Trebi was the early maturing Atlas 46.

B 120-88-44 (8105) was the only variety to yield significantly less than Trebi.

Lodging was very near 100% for all varieties in the nursery, consequently no notes were taken. No diseases were observed.

Table No. 26
Yield & Agronomic Data for Spring Barley Varieties Grown in Jefferson County
James Klann Farm 1953 Madras, Oregon

Variety	Pedi- gree	Days to Head	Days to Ripe	Plant Ht. Inches	Lodging	Diseases	Bu. Wt.	Yield Bu./A.	% Treb
Trebi	936	92	140	37.7	(X)	(Y)	46.2	91.6	100.0
Hannchen	531	94	142	38.7			51.3	85.4	93.8
Bonneville	7248	95	142	45.7			44.3	89.0	97.2
Hannchen X Minie	7156	99	142	39.0			49.2	102.6	112.0
Sel. from C.C. 5461	7245	87	143	39.7			44.5	104.0	113.5
Gém	7243	85	142	38.0			44.7	109.9	119.9
Harlan	7008	85	144	40.0			43.7	98.3	107.3
B ^C 4 15	7558	100	142	46.3			44.0	91.1	99.5
B 120 - 88 - 44	8105	94	142	45.7			42.8	69.9	76.3
Sel. from C. C. 5461	7322	88	141	43.0			44.2	94.4	103.1
Sel. from C. C. 5461	7244	87	140	29.0			42.8	96.3	105.1
Atlas 46	7323	83	139	41.7			43.5	115.6	126.4
Ymer	7275	100	143	34.0			50.5	100.9	110.1
(Ezond X Frontier) Wyo. Sel. 462		90	143	41.3			47.5	101.5	110.8
Hannchen	4841	99	141	38.7			50.8	87.7	95.7
Ws. 471	8055	86	142	42.7			45.7	91.4	99.8
(Ezond X Frontier) Wyo. Sel. 480		90	144	41.3			48.0	89.4	97.6
Frontier	7155	100	143	37.0			48.2	81.3	88.8
B 120 - 78 - 10	8059	90	143	40.3			46.3	89.8	98.0
B 120 - 78 - 14		102	144	45.7			43.7	87.8	95.9
L.S.D. @ .05	19.9 Bu.								
Coefficient of Variation	12.9%								

(X) Lodging was practically 100% for each variety.

(Y) No diseases observed.

Table No. 27
 Spring Barley Varieties Grown in Spring Grain Varietal Nurseries
 During Years 1948-53 Inclusive. Table Shows Yield of Variety in Bushels Per
 Acre for Years Grown & in Percent of Trebi

Variety	Pedi- gree	Yield in Bushels Per Acre						Mean Trebi	No. of Trials	Years Grown	
		1948	1949	1950	1951	1952	1953				
Trebi	936	43.4	59.5	38.2	62.7	28.9	91.6	54.1	100	13	6
Hannchen	531	49.0	52.1	60.5	58.3	26.8	85.4	55.4	102.4	13	6
Bonneville	7248	49.6	57.6	38.4	63.4	33.6	89.0	55.3	102.2	13	6
Hannchen X Minia	7156	61.6	65.3	49.6	61.1	21.5	102.6	60.3	111.5	12	6
Sel. from CC 5461	7245	73.0	68.7	49.9	59.9	23.3	114.0	64.8	119.8	9	6
Gem	7243	48.9	57.3	53.5	65.6	26.4	109.9	60.3	111.5	12	6
Frontier	7155	62.3	61.2	34.4	65.0	26.4	81.3	55.6	102.8	13	6
Trebi	936	43.4	59.5	38.2	62.7	28.9	91.6	56.2	100.0	8	5
Harlan	7008	41.0	-	42.0	67.6	20.4	98.3	53.9	95.9	8	5
Trebi	936	-	59.5	38.2	62.7	28.9	91.6	56.2	100	10	5
Sel. from CC 5461	7322	-	61.8	44.6	69.0	29.6	94.4	59.9	106.6	10	5
Sel. from CC 5461	7244	-	53.1	54.1	62.2	27.1	96.3	58.6	104.3	10	5
Atlas 46	7323	-	74.8	47.4	53.7	21.2	115.6	62.5	111.2	8	5
Trebi	936	-	-	38.2	62.7	28.9	91.6	55.4	100.0	7	4
Ymer	7275	-	-	56.3	60.6	29.4	100.9	61.8	111.6	7	4
Hannchen	4841	-	-	58.6	53.2	31.1	78.7	57.7	104.2	7	4
WS 471	8055	-	-	49.3	57.5	29.0	91.4	56.8	102.5	7	4
Trebi	936	-	-	-	-	28.9	91.6	60.3	100.0	2	2
BC ₄ 15	7558	-	-	-	-	31.9	91.1	61.5	102.0	2	2
B 120-88-44	8105	-	-	-	-	38.5	69.9	54.2	89.9	2	2
Wyo. Sel. 462 (Ezond X Frontier)	-	-	-	-	-	38.6	101.5	70.1	116.3	2	2
Wyo. Sel. 480 (Ezond X Frontier)	8104	-	-	-	-	36.5	89.4	63.0	104.5	2	2
B-120-78-10	8059	-	-	-	-	34.4	89.8	62.1	103.0	2	2
B-120-78-14	-	-	-	-	-	40.6	87.8	64.2	106.5	2	2

Table No. 28
Spring Barley Varieties Grown & Discarded from
Varietal Nursery during Years 1948-1952 Inclusive

Variety	Pedi- gree	Yield in Bushels Per Acre							% Trobi	No. of Trials	Years Grown
		1948	1949	1950	1951	1952	1953	Mean			
Trobi (1)	936	43.4	59.5	38.2	62.7	28.9	91.6	54.1	100	13	6
Rojo	5401	34.6	-	-	-	-	-	34.6	79.7	3	1
Compena	5438	40.7	-	-	-	-	-	40.7	93.8	3	1
Lico	6279	42.7	55.9	-	-	-	-	49.7	95.7	5	2
Glacier	6976	45.3	47.2	-	-	-	-	46.3	89.9	5	2
Moro Sel 416206	-	-	52.2	-	-	-	-	52.2	87.7	2	1
Union Beardless	-	-	52.0	-	-	-	-	52.0	87.4	2	1
Spray	-	-	47.7	-	-	-	-	47.7	80.2	2	1
Colo. 3063 X Winter Club											
	7247	-	51.0	-	-	-	-	51.0	85.7	2	1
Velvon 11	7088	44.7	53.2	43.8	-	-	-	47.2	100.4	9	3
Good-Delta X Everest	7147	45.6	64.3	44.6	61.3	-	-	54.0	106.1	10	4
Sel. from CC 5461	7152	49.2	56.4	47.3	60.9	-	-	53.5	105.1	11	4
Sel. from CC 5461	7154	-	59.5	55.2	64.7	-	-	59.8	101.8	8	3
Moore	7251	-	-	49.7	48.2	-	-	46.0	91.1	5	2
Hull-less (Local)	-	-	-	33.1	34.3	-	-	33.7	66.7	5	2
Improved Arivat	7534	-	-	48.6	57.1	-	-	52.9	104.8	5	2

(1) Check variety

(2) Percent of Trobi for the years the variety was grown.

A summary of the varieties in the nursery showing the mean yield for the years grown and the percent of Trebi is presented in Table No. 27. Of the varieties grown more than two years Sel. from C.C. 5461 (7245) is the highest yielding having exceeded the yield of Trebi four out of six years.

Those varieties which have been grown and discarded from the nurseries are presented in Table 28.

Winter Wheat Varietal Nursery:

The winter wheat varietal nursery was established to obtain information on some of the better appearing varieties developed for dryland conditions. The varieties were obtained from the Sherman Branch Experiment Station at Moro, Oregon, in the fall of 1950. This is the third consecutive season these varieties have been grown on the Gerald Thornton Ranch in Ashwood.

The varieties were seeded October 28, 1952, in an area chosen at an earlier date because it was impossible to seed at the same time as Mr. Thornton.

Because of an error, replications one and two were seeded into an area previously seeded by the farmer and were not harvested.

The results of this trial are presented in Table No. 29. Because of the low yield, it was impossible to take the bushel weight on several varieties.

The varietal yields of this nursery were erratic. The yield of Federation as indicated by Table No. 29 was the highest yielding variety of the nursery. This was probably true because Federation, under field conditions, outyielded the true winter varieties during the 1953 crop year.

Table No. 30 is a summary of the variety yields on the Gerald Thornton Ranch for the years 1951, 1952, and 1953.

The data hasn't been submitted to statistical analysis because of the large variation encountered each year.

The three year mean is probably a reasonable indication of a given variety's adaptability in the Ashwood area.

Table No. 29

Yield of Dryland Winter Wheat Varieties Grown at Ashwood, Oregon

1953

Gerald Thornton Ranch
 Yield in Bushels Per Acre
 Seeded October 28, 1952

Variety	Pedigree	Yield by Replication		Mean Yield	Bushel Weight
		III	IV		
Elmar	12392	37.0	14.2	25.6	59.0
Rex	11689	23.2	16.6	19.9	—*
Brevor	12385	36.0	7.3	21.7	60.0
Rio-Rex x Cheyenne	12925	25.2	20.2	22.7	64.0
Rio-Rex x Nebred	12928	22.7	17.5	20.1	—
Golden	10063	24.6	13.4	19.0	—
Rio	10061	18.3	34.8	26.5	64.0
Blackhull-Rex x Cheyenne (Moro No. 482294)		20.7	25.1	22.9	64.0
Elgin	11755	21.2	14.2	17.7	—
Federation	4734	25.3	33.4	29.3	59.0
Orfed	11913	23.8	16.0	19.9	—
Kharkof	1442	20.8	20.7	20.8	—
Wasatch	11925	17.5	16.9	17.2	—

*Insufficient sample for Bushel Weight measure

Table No. 30
 Mean Yield for Dryland Winter Wheat Varieties Grown at Ashwood, Oregon for the years
 1951, 1952 & 1953

Variety	Pedigree	Mean Yield			Three Year Mean
		Bushels Per Acre			
		1951	1952	1953	
Elmar	12392	29.7	31.8	25.6	29.0
Rex	11689	27.2	33.5	19.9	26.9
Brevor	12385	22.0	34.6	21.7	26.1
Rio-Rex x Cheyenne	12925	21.1	34.5	22.7	26.1
Rio-Rex x Nebred	12928	21.5	35.1	20.1	25.6
Golden	10063	23.2	32.4	19.0	24.9
Rio	10061	19.1	28.2	26.5	24.6
Blackhull-Rex x Cheyenne	Moro No. 482294	19.9	30.4	22.9	24.4
Elgin	11755	21.7	32.2	17.7	23.9
Federation	4734	12.0	30.5	29.3	23.9
Orfed	11913	18.2	32.4	19.9	23.5
Kharkof	1442	20.7	25.9	20.8	22.5
Wasatch	11925	20.7	29.3	17.2	22.4

Dryland Winter Wheat Fertility Experiment

The experiment was planned to obtain more information on the value of nitrogen fertilization of dryland winter wheat under conditions of relatively low rainfall, 10-12 inches, and soil depths ranging from 2-4 feet such as are found in the Grizzly and Ashwood sections of Jefferson County.

The objectives of the experiment were to determine whether there was a nitrogen response and if there was a response the approximate magnitude of the response. To determine whether there was difference in response between ammonium sulphate and ammonium nitrate. To determine whether there is any value in split fall and spring nitrogen applications. If there is an advantage, then it would be expected that ammonium nitrate should be the most desirable since it is considered more readily available than ammonium sulphate.

The experiment consisted of two trials, one on the Gerald Thornton Ranch, Ashwood, and the other on the George Rufener Ranch, Grizzly. Each trial was of a randomized block design with four replications. The plots were rod square.

The fertilizer was mixed with one pound can of dampened Zonolite just prior to application. The Zonolite (vermiculite) adds bulk to the fertilizer for better distribution and makes fertilizer application possible during moderately windy weather.

The dates of fertilizer application for the two trials were:

Gerald Thornton - Ashwood

Fall - October 29, 1952

Spring - April 24, 1953

George Rufener - Grizzly

Fall - November 11, 1952

Spring - April 24, 1953

At the time of the spring application soil moisture samples were taken from the two sites.

At harvest three nine-square-foot samples were taken from each plot. The samples were composited, wrapped and brought in to Redmond for threshing in the plot thresher.

Results

The grain yields by replication for location are presented in Table No. 30 and 31. Table No. 32 has the mean yields of both trials and the comparison between treatment and in terms of bushels increase or decrease.

The results from the Ashwood trial indicate that nitrogen significantly increased yield and that ammonium sulphate was significantly better than ammonium nitrate. While the yields generally increased with each increment of 16.75 pounds of nitrogen added, the greatest return per increment of fertilizer added came at the first level of nitrogen whether it was applied as ammonium

Table No. 31

Dryland Winter Wheat Fertility Trial

Gerald Thornton Ranch - Ashwood, Oregon

Local Turkey Wheat

Fertilizer Application			Yield				Mean	Bushel
Pounds Per Acre as			Bushels Per Acre					
Ammonium Sulphate	Ammonium Nitrate	N	By Replication				Yield	Weight
			I	II	III	IV		
-	-	-	14.5	16.5	12.1	15.5	14.7	60.0
-	50	16.75	19.2	15.6	21.7	21.1	19.4	60.0
-	100	33.50	24.1	24.9	23.6	15.9	22.1	59.0
-	150	50.25	22.9	18.8	19.6	22.4	20.9	59.0
-	200	67.00	24.2	21.9	25.5	22.7	23.6	58.0
80	-	16.75	21.4	23.0	22.5	27.5	23.6	60.0
160	-	33.50	24.8	22.7	20.7	31.7	25.0	59.5
240	-	50.25	29.1	20.8	25.1	24.9	25.0	58.5
320	-	67.00	42.4	28.3	22.8	20.3	28.5	58.0
80 (S)	50 (F)	33.50	30.7	30.5	28.3	27.1	29.2	60.0
80 (F)	50 (S)	33.50	34.6	27.1	31.7	26.8	20.0	59.5

L.S.D. @ 5% 5.8
Co. of Var. 17%

Fertilizer Application Dates

Fall - October 29, 1952

Spring - April 24, 1953

Table No. 32

Summary of Dryland Winter Wheat Fertility Trials

Gerald Thornton Ranch - Ashwood, Oregon - Local Turkey
George Rufener Ranch - Grizzly, Oregon - Elmar

Fertilizer Application Pounds Per Acre as			ASHWOOD			GRIZZLY		
			Yield Bushels Per A.	Deviation from Check	Bushel Weight	Yield Bushels Per A.	Deviation from Check	Bushel Weight
Ammonium Sulphate	Ammonium Nitrate	N						
-	-	-	14.7	-	60.0	33.6	-	56.25
-	50	16.75	19.4	4.7+	60.0	36.4	2.8+	56.25
-	100	33.50	22.1	7.4	59.0	41.9	8.3	56.75
-	150	50.25	20.9	6.2	59.0	46.1	12.5	57.25
-	200	67.00	23.6	8.9	58.0	37.8	4.2	56.50
80	-	16.75	23.6	8.9	60.0	37.7	4.1	56.50
160	-	33.50	25.0	10.3	59.5	36.2	2.6	56.25
240	-	50.25	25.0	10.3	58.5	43.1	9.5	56.75
320	-	67.00	28.5	13.8	58.0	48.3	14.7	56.75
80 (S)	50 (F)	33.50	29.2	14.5	60.0	40.6	7.0	56.25
80 (F)	50 (S)	33.50	30.0	15.3	59.5	31.3	2.3-	56.00
			L.S.D. @ 5% 5.8			L.S.D. @ 5% N.S.		
			Co. of var. 17%			Co. of Var: 20.4%		

Fertilizer Application Dates

Ashwood

Fall - October 29, 1952

Spring - April 24, 1953

Grizzly

Fall - November 11, 1952

Spring - April 24, 1953

sulphate or ammonium nitrate. With both sources of fertilizer, the second increment of nitrogen was profitable but return per dollar investment of fertilizer was markedly reduced. Beyond the second nitrogen increment, 33 pounds of N, yield increases from nitrogen fertilizer were not profitable.

The split application treatments were not significantly better than the single ammonium sulfate treatment. Also, there was no yield difference evident whether ammonium sulphate or ammonium nitrate was applied in the spring.

The bushel weight of the grain dropped from 60 pounds per bushel at 16.75 of N to 58 pounds per bushel at 67 pounds of N. The trend was similar for both sources of N.

In considering these results it should be realized that 1953 was a favorable year for moisture and that in the 1952 trials there were no significant increases from the use of nitrogen fertilizer.

The Grizzly trial produced no significant increases in yield; however the same general trend in response to nitrogen fertilizer can be observed.

The trend toward a lower bushel weight as the nitrogen increased was not apparent in the Grizzly trial.

The soil depths in the trial areas (Table No. 33) indicate why there was more yield variation in the Grizzly trial than in the Ashwood trial. The Grizzly trial varied in soil depth from 18 inches to 40 inches while the Ashwood trial varied from 24 inches to 36 inches. Without knowing the moisture-holding capacities of the two soils, the percentage moisture is somewhat meaningless; however, it appeared that both soils approached field capacity at the time of sampling.

Summary

An experiment designed to give information on the source and rate of nitrogen was conducted. The experiment consisted of five levels of nitrogen fertilization with ammonium nitrate and ammonium sulphate as the sources of N.

Two extra treatments were included. They were split application of $33\frac{1}{2}$ pounds of nitrogen. In one treatment one-half the nitrogen was applied in the fall as ammonium nitrate and the other half in the spring as ammonium nitrate. In the second treatment the source of N were reversed.

Two locations (Ashwood and Grizzly) were used in the experiment. At the Ashwood location there was a significant increase in yield from the use of N. Ammonium sulphate was significantly superior to ammonium nitrate as the source of N. There was no advantage of a split application over a single application of ammonium sulphate.

The results at the Grizzly location were not significant; however they followed the same general response pattern as the Ashwood trial.

In the Ashwood trial the bushel weight tended to drop as the nitrogen level increased. This trend was not apparent in the Grizzly trial.

Moisture percentages and soil depths from the trial area are presented from samples taken on April 24, 1953. From observation the fields appeared to be near field capacity at that time.

Table No. 33

Percentage of Moisture in soil for each foot of soil depth at
Ashwood and Grizzly Dryland Winter
Wheat Fertility Trial - 1953

Soil Depth Feet	Percentage of Moisture in Soil				
	Sample No.				
	1	2	3	4	Mean
	<u>Ashwood</u>				
1	15.4	14.0	13.7	20.5	15.9
2	34.5	27.2	26.1	22.4	27.6
3	28.4		7.4(1)		17.9
	(1) Soil depth $2\frac{1}{2}$ feet				
	<u>Grizzly</u>				
1	19.3	17.5	18.5	17.9	18.3
2	26.1	20.9	16.5(1)	26.5	22.5
3	30.3	15.0		22.6	22.6
$3\frac{1}{2}$	30.5				30.5
	(1) Soil depth $1\frac{1}{2}$ feet				