

VARIETAL EVALUATION OF CEREAL GRAINS IN CENTRAL OREGON

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ACTIVITIES AND RESULTS

Eight replicated yield trials were established at three sites of Central Oregon Experiment Station in 1983. Table 1 indicates the various trials grown, their location, and the number of lines grown.

Table 1. Summary of cereal grain variety trials planted in Central Oregon in 1983

TRIAL	LOCATION	NO. OF LINES
Winter Wheat Variety Trial	Madras	46
Winter Wheat Advanced Selections	Powell Butte	34
Spring Wheat Western Regional	Madras	48
Spring Wheat Advanced Selections	Powell Butte	16
Winter Barley Elite	Madras	28
Spring Barley Private Variety	Madras	12
Spring Barley Maturity	Redmond	4
Spring Oat Variety Trial	Redmond	8

A severe hailstorm at Madras on July 31, 1983, destroyed most of the trials. The barley trials were especially hard hit, and 99% of the grain was shattered from the grain heads. The winter wheat trial was also severely damaged, although some plots were combined to provide seed for 1984 trials. The spring wheat trial at Madras was harvested. Varieties that were mature at the time of the hailstorm were shattered more than the greener, less mature varieties. The data gathered are of questionable value and will not be used for recommendations.

WINTER WHEAT

Table 2 summarizes the Powell Butte winter wheat variety trial. The trial was planted November 15, 1982, at 96 lbs/acre. On April 20, 1983, 606 lbs/acre of 27-12-0 (NPK) fertilizer was applied. Two pints of Bronate were applied for weed control on April 19, 1983.

Selection 72339 continues to show excellent potential. Table 3 summarizes the performance of 72339 over the past five years at Powell Butte and Madras.

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Table 2. Powell Butte winter wheat variety trial, 1983

VARIETY	YIELD bu/acre	TEST WT. lbs/bu	PLANT HT. in	LODGING %
72-1220	142.8	55.5	38	10
OWW70364	139.1	56.2	40	0
Hill '81	137.6	56.3	40	0
OWW70111	137.1	57.9	39	0
OWW71439	137.0	55.4	37	0
OWW74295C	133.7	57.9	42	20
McDermid	133.0	56.5	39	0
Hyslop	132.1	55.4	39	0
SMT74-72	130.7	55.9	39	0
SW069086	125.7	56.8	40	0
SW071340	125.0	58.6	39	0
SWH72053	124.9	54.8	38	0
SW069282	124.7	57.9	39	10
SMT74-84	124.1	56.7	39	40
OWW71214	120.0	56.4	39	5
Faro	119.9	53.6	38	20
SMT74-48	119.1	55.1	36	0
SWH72434	116.8	56.2	38	0
OWW71730	114.3	54.0	38	0
OWW71229	112.8	52.2	38	0
Jackmar	112.3	52.8	35	0
OWW72435	111.1	54.7	41	25
OWW72342	110.9	55.7	36	0
OWW71603	110.8	53.8	39	5
Yamhill Dwarf	109.8	51.2	36	15
Daws	108.9	53.8	40	0
OWW74337C	103.0	53.5	39	0
OWW72339	99.8	52.4	37	0
OWW70094	98.5	54.3	37	0
Stephens	98.5	51.1	37	0
OWW72341	94.3	52.1	36	0
OWW72082	92.8	50.7	35	0
Nugaines	87.2	54.3	36	0
SW0730979C	80.8	51.3	34	0
Average	116.7	54.7	38	5
LSD 5%	16.6	2.0	3	-

Data collected in 1983 indicates that 72339 is very similar to Stephens in disease susceptibility, especially to Septoria. Selection 72339 was also infected by stem rust in 1983.

Head rows of 72339 have been planted in Redmond and breeders seed will be available in the fall of 1984.

Table 3. The yield of 72339 compared with check varieties from 1979-1983 at Powell Butte and Madras, Oregon

VARIETY	POWELL BUTTE					AVERAGE
	1979	1980	1981	1982	1983	
	-----bu/acre-----					
72339	118	147	124	159	100	130
Stephens	101	136	101	132	98	114
Daws	105	122	122	140	109	120
Hill '81	79	119	119	146	138	120

VARIETY	MADRAS					AVERAGE
	1979	1980	1981	1982	1983*	
	-----bu/acre-----					
72339	96	148	154	123	62	117
Stephens	76	144	141	78	63	100
Daws	81	152	137	85	54	102
Hill '81	91	132	134	89	66	102

* Hail Damaged.

SPRING WHEAT

Emphasis has been placed on identifying high-yield, disease resistant, short-stawed varieties. At present, the majority of spring wheat varieties are several inches taller than winter wheat, are more susceptible to lodging and leaf stripe rust. Several short-stawed varieties were obtained from Aberdeen, Idaho, and grown at Madras. No performance data are available because of the hailstorm, but a small quantity of seed is available for planting in 1984.

Of the available varieties, Twin is most widely adapted to Central Oregon. Several selections in the Powell Butte trial yielded better than Twin, had better test weights, but were taller. Table 4 summarizes the results of the spring wheat variety trial conducted at Powell Butte.

Table 5 summarizes the performance of selected spring wheat varieties at Powell Butte and Madras. The summaries are based on two years of data at each location.

Table 4. Powell Butte Spring Wheat Variety Trial, 1983

VARIETY	CLASS	YIELD	TEST WT.	PLANT HT.	HEAD DATE	STRIPE RUST
		bu/acre	lbs/bu	in	mo/day	%
K7905168	SW	90.1	59.0	38	7/11	0
WAMPUM	HR	88.3	59.0	43	7/12	0
K7905171	SW	85.3	58.7	37	7/13	0
ID0228	SW	85.0	58.7	39	7/14	10
ID0225	SW	84.7	57.8	39	7/10	25
FIELDER	SW	81.6	58.9	38	7/9	40
906R	HR	81.6	59.6	38	7/9	0
ID0249	SW	81.6	59.3	37	7/14	40
ID0253	SW	77.8	59.8	37	7/10	0
OWENS	SW	72.9	58.4	39	7/10	40
TWIN	SW	72.2	56.9	37	7/10	10
ID0250	SW	71.9	57.4	39	7/10	5
DIRKWIN	SW	65.6	56.1	38	7/15	5
McKAY	HR	64.2	58.6	37	7/9	0
WAVERLY	SW	64.0	57.5	39	7/11	0
WALLADAY	SW	52.6	56.1	39	7/12	60
AVERAGE		72.6	58.2	39	7/11	15
LSD (5%)		9.2	.9	4	4	--

Planted 4/5/83 at 96 lbs/acre, Fertilized with 500 lbs of 27-12-0.

Table 5. Spring wheat variety performance in Central Oregon

		MADRAS ¹						
VARIETY	CLASS	AVERAGE YIELD	TEST WT.	HEAD DATE	PLANT HT.	LODGING	STRIPE RUST	PROTEIN
		bu/acre	lbs/bu	mo/day	in	%		%
OWENS	SW	92.7	58.7	6/27	37	15	R	10.8
TWIN	SW	92.1	56.6	6/27	38	10	VR	10.9
WAVERLY	SW	90.3	57.3	6/29	36	15	VR	11.8
McKAY	HR	87.3	58.8	6/27	37	15	R	10.8
WAMPUM	HR	86.2	57.5	6/27	40	15	VR	12.6
FIELDER	SM	85.1	57.4	6/27	37	0	VS	10.6
DIRKWIN	SW	83.0	56.3	6/28	38	0	VR	11.9
WALLADAY	SW	81.1	56.9	7/5	36	0	MR	10.1

		POWELL BUTTE ²						
VARIETY	CLASS	AVERAGE YIELD	TEST WT.	HEAD DATE	PLANT HT.	LODGING	STRIPE RUST	PROTEIN
		bu/acre	lbs/bu	mo/day	in	%		%
WAMPUM	HR	103.5	59.1	7/9	44	15	VR	-
FIELDER	SW	99.8	59.6	7/7	38	10	VS	-
WAVERLY	SW	97.6	58.1	7/8	38	0	VR	-
TWIN	SW	96.2	57.1	7/7	37	30	R	-
OWENS	SW	95.3	59.0	7/7	38	40	MS	-
WALLADAY	SW	92.9	56.8	7/11	39	0	MS	-
McKAY	HR	88.5	58.8	7/7	38	0	VR	-
DIRKWIN	SW	87.1	56.3	7/9	39	30	VR	-

1 - 1981 and 1982 data (Hail damaged 1983 trials).

2 - 1982 and 1983 data.

SPRING BARLEY

A trial was planted at Redmond to determine the earliness of maturity of selected spring barley varieties. In Central Oregon, an early maturing spring barley variety would be beneficial in rotating to alfalfa. The spring barley grain crop would mature in early August and alfalfa could be planted in the grain stubble. Thus, the alfalfa would be well established by winter and one crop year could be saved in establishing the alfalfa stand.

The spring barley varieties Steptoe, Kombar, Advance, and Poco were planted at two dates and two seeding rates. Results are summarized in Tables 6 and 7.

Table 6. Yield, test weight, height, and ripening date of four spring barley varieties planted April 15, 1983, at Redmond, Oregon

VARIETY	SEEDING	YIELD	TEST	PLANT	RIPE
	RATE		WT.	HEIGHT	DATE
	lbs/acre	tons/acre	lbs/bu	in	mo/day
Poco	100	2.16	46.6	19	8/8
	160	2.35	46.4	19	8/8
Steptoe	100	2.75	47.0	32	8/17
	160	2.77	46.1	31	8/17
Kombar	100	2.70	45.3	29	8/17
	160	2.78	45.1	28	8/16
Advance	100	2.23	44.5	29	8/14
	160	2.09	44.0	30	8/14
LSD 5%	-	0.42	1.3	3	8/3

Fertilized with 570 lbs/acre of 16-20-0.

Table 7. Yield, test weight, height, and ripening date of four spring barley varieties planted May 2, 1983, at Redmond, Oregon

VARIETY	SEEDING	YIELD	TEST	PLANT	RIPE
	RATE		WT.	HEIGHT	DATE
	lbs/acre	tons/acre	lbs/bu	in	mo/day
Poco	100	2.03	45.8	21	8/16
	160	2.57	46.0	22	8/16
Steptoe	100	2.19	44.4	38	8/20
	160	2.29	44.6	37	8/20
Kombar	100	1.23	40.1	30	8/26
	160	1.71	42.0	30	8/24
Advance	100	1.60	42.3	34	8/18
	160	2.15	43.0	33	8/16
LSD 5%	-	0.42	1.3	3	8/3

Fertilized with 570 lbs/acre of 16-20-0.

The data suggest that more than two tons of Poco barley can be harvested by early August, thus enabling alfalfa to be seeded in the stubble by mid-August. The variety Poco was earlier and shorter than the other varieties evaluated. Increasing the seeding rate at the later planting date increased grain yields, but late seeding prolonged grain maturity about one week.

SPRING OATS

Eight spring oat varieties were evaluated at Redmond for grain yield, test weight, plant height, and hay yields. The varieties were planted April 15, 1983, at 80 lbs/acre. One-half of the plot area was cut for hay on August 3, 1983; most of the varieties were in the soft dough stage. Results are summarized in Table 8.

Table 8. Redmond Spring Oat Variety Trial, 1983

VARIETY	GRAIN YIELD tons/acre	HAY YIELD tons/acre	TEST WT. lbs/bu	PLANT HEIGHT in	LODGING %
74 AB2300	2.49	6.04	39.5	50	25
75 AB661	2.11	6.32	38.8	49	0
Cayuse	2.07	6.47	40.5	52	10
Menominee	1.79	6.06	40.8	54	25
Park	1.60	5.90	37.3	54	10
Corbit	1.55	6.28	36.8	52	35
S 7884	1.39	6.00	39.4	54	5
Texas Red	1.05	5.27	34.2	54	45
LSD 5%	.50	NS	2.1	4	NS

Fertilized March 14, 1983, with 570 lbs/A of 16-20-0.

BENEFITS

The primary objective of the cereals project in Central Oregon is to evaluate potential new varieties for yield, test weight, maturity, height, lodging, winter hardiness, and disease resistance. The release of selection 72339 in 1984 will have significant impact on Central Oregon wheat growers. The yields of 72339 have averaged 115% of Stephens the last five years.

The search for better spring wheat varieties will continue. Central Oregon wheat producers have requested high yielding, short-strawed, rust resistant varieties. Yield trials included varieties from private industry, Washington, Oregon, and Idaho.

Early maturing barley varieties such as Poco may fit well into the rotation schedules of Central Oregon growers. Traditionally, alfalfa has been seeded in the spring and one small, weedy cutting taken the establishment year. It

may be possible to harvest more than two tons of barley and then seed the alfalfa in the barley stubble in late summer. Full alfalfa production would be possible the following year.

Central Oregon also served as a cooperating site in the statewide cereals testing program. Variety information was obtained for irrigated and severe winter areas.