

## 2004 WINTER ELITE WHEAT TRIAL

Eric P. Eldredge, Clinton C. Shock, and Lamont D. Saunders  
Malheur Experiment Station  
Oregon State University  
Ontario, OR

### Introduction

Malheur Experiment Station provides one location for the Oregon State University Statewide Winter Elite Wheat variety-testing program. This location compares cereal grain variety performance in a furrow-irrigated, high potential yield environment. Plant breeders can use information on variety performance to compare advanced lines with released cultivars. Growers can use this information to make decisions about which soft white winter wheat varieties may perform best in their fields.

### Methods

The previous crop was sweet corn. After harvest, the corn stalks were flailed, the field was disked, and the soil was sampled and analyzed. The analysis showed 138 lb nitrogen (N), 80 lb available phosphate ( $P_2O_5$ ), 1,478 lb soluble potash ( $K_2O$ ), and 70 lb sulfate ( $SO_4$ )/acre in the top 2 ft of soil, with 2,361 ppm calcium (Ca), 443 ppm magnesium (Mg), 107 ppm sodium (Na), 1.7 ppm zinc (Zn), 26 ppm iron (Fe), 7 ppm manganese (Mn), 0.6 ppm copper (Cu), 0.8 ppm boron (B), pH 7.6, and 3.2 percent organic matter in the top foot of soil. Pre-plant fertilizer was a broadcast application on October 7, 2003 of 97 lb N/acre, 5 lb Cu/acre, and 1 lb B/acre. The soil was deep ripped, plowed, and groundhogged to prepare the seedbed. The field was corrugated into 30-inch rows.

The Winter Elite Wheat Trial was comprised of 40 soft white winter wheat cultivars or lines, 3 of which were club head types. Seed of all entries was treated with fungicide and insecticide seed treatment prior to planting. Grain was planted at 30 live seed/ft<sup>2</sup>, corresponding to a seeding rate of approximately 110 lb/acre. The experimental design was a randomized complete block with three replications. Grain was planted on October 17, 2003, with a small plot grain drill, into plots 5 by 20 ft, and then the field was recorruagated. The field was partially furrow irrigated on November 11 to promote emergence. The irrigation had to be stopped because the runoff water was interfering with irrigation district repairs.

A soil sample was taken from the field on April 2, 2004. The soil analysis showed ammonia and nitrate forms of N in the top 2 ft of soil totaled 86 lb N, with 38 lb extractable  $P_2O_5$ , 861 lb available  $K_2O$ , 83 lb  $SO_4$ /acre in the top 2 ft of soil, with 12 ppm Ca, 370 ppm Mg, 108 ppm Na, 1.2 ppm Zn, 2 ppm Fe, 1 ppm Mn, 0.5 ppm Cu, 1 ppm B, pH 7.7, and 3.2 percent organic matter. Urea prills fertilizer (95.6 lb N/acre) was

broadcast over the trial on March 30, 2004. This application was an error. Broadleaf weeds were controlled with Bronate<sup>®</sup> at 1qt/acre applied on May 3. On May 20, fertilizer was broadcast to supply 13 lb N/acre, 60 lb P<sub>2</sub>O<sub>5</sub>/acre, 3 lb Zn/acre, and 1 lb Cu/acre. The field was furrow irrigated for 24 hours on April 9, May 5, and June 3. Observations of heading date were started on June 4, after 100 percent heading had already occurred in many varieties. Heading date observations should have started in May. Alleys 5 ft wide were cut with a Hege small plot combine on July 21. The length of each plot was measured and recorded after the alleys were cut, and the plots were harvested on July 21 with a Hege small plot combine.

## Results

The grain plants in the Winter Elite Wheat Trial grew very lush, with lodging already observed on May 20, before heading. A thunderstorm brought 0.41 inch of rain and strong winds on May 18, followed by 0.89 more inches of rain in storms with wind over the following 10 days, contributing to the lodging that was observed. Plant height at maturity could not be measured in the trial this year because of extensive lodging. The residual nitrate plus ammonium in the fall of 2003 was substantial, and the trial received too much N fertilizer during its growth and development.

Among the soft white winter wheat varieties, the highest yielding was 'ORH010918' at 115 bushel/acre, which was not significantly (at LSD 0.05) higher than other entries in this trial (Table 1). Due to the heavy lodging observed, the trial is useful to compare variety resistance to lodging. ORH010918 was the only entry to show no lodging at harvest, suggesting that it may have exceptional straw strength, similar to 'ORCF-101', 'ORH011483', 'ORH010920', 'CODA', 'ORI2020015', 'OR9901887', 'MEL', 'SIMON', 'CLEARFIRST', and 'OR9900513', which were among the least severely lodged entries in this trial.

Table 1. Winter Elite Wheat Trial entries, market class, lodging, and yield, Malheur Experiment Station, Oregon State University, Ontario, OR, 2005.

Entry	Variety	Market class	Origin or developer	Lodging %	Yield* bushel <sup>†</sup> /acre
37	ORH010918	SWW	OSU	0	115.3
1	STEPHENS	SWW	OSU	57	114.3
31	OR9901887	SWW	OSU	43	113.2
25	OR9801757	SWW	OSU	97	107.4
23	OR3970965	SWW	OSU	90	106.6
40	ORH011483	SWW	OSU	17	106.3
39	ORH011481	SWW	OSU	60	105.9
10	DUNE	SWW	U of I	60	105.3
3	GENE	SWW	OSU	60	105.2
38	ORH010920	SWW	OSU	30	103.8
9	SIMON	SWW	U of I	47	102.4
36	OR2010353	SWW	OSU	100	99.5
19	ORCF-101	SWW-Clearfield	OSU	3	98.8
8	BRUNDAGE96	SWW	U of I	67	98.6
26	OR9900553	SWW	OSU	67	97.1
14	CODA	Club	ARS-WSU	37	96.6
33	OR2010239	SWW	OSU	67	95.7
35	OR2010242	SWW	OSU	90	95.0
7	ROD	SWW	WSU	97	94.6
21	ORI2020015	SWW-Clearfield	OSU	40	93.4
20	ORI2010007	SWW-Clearfield	OSU	67	93.2
18	IDO587CL	SWW-Clearfield	U of I	70	91.8
11	ID92-22407A	SWW	U of I	57	89.5
17	CLEARFIRST	SWW-Clearfield	Gen. Mills	50	89.3
34	OR2010241	SWW	OSU	83	88.5
28	OR9900598	SWW	OSU	90	88.0
4	WEATHERFORD	SWW	OSU	93	87.7
16	MEL	Club-Clearfield	Gen. Mills	43	87.2
6	FINCH	SWW	ARS-WSU	63	85.4
30	OR9900513	SWW	OSU	50	85.4
24	OR9801695	SWW	OSU	80	84.3
13	WESTBRD528	SWW	Westbred	90	83.2
2	MADSEN	SWW	ARS-WSU	80	80.8
32	OR9901619	SWW	OSU	90	80.1
5	TUBBS	SWW	OSU	97	78.2
29	OR9900547	SWW	OSU	93	75.1
15	CHUKAR	Club	ARS-WSU	57	74.5
12	MOHLER	SWW	Westbred	100	64.4
27	OR9900548	SWW	OSU	100	63.8
22	OR941611	SWW	OSU	70	63.2
	Mean			66.3	92.2
	LSD (0.05)			52.1	NS <sup>‡</sup>

\*Adjusted to 10% moisture, <sup>†</sup>60 lb/bushel.

<sup>‡</sup>NS = Not Significant.