

2006 WINTER ELITE WHEAT TRIAL

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Introduction

Malheur Experiment Station provides one location for the Oregon State University Statewide Winter Elite Wheat variety testing program. This location compares soft white winter wheat variety performance in a furrow-irrigated, high yield potential 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 trial was grown on Owyhee silt loam where 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 69 lb available nitrogen (N) per acre in the top 2 ft of soil. The top foot of soil contained 25 ppm phosphorus (P), 313 ppm potassium (K), and 16 ppm sulfate (SO₄)/acre, 2,442 ppm calcium (Ca), 501 ppm magnesium (Mg), 107 ppm sodium (Na), 1.7 ppm zinc (Zn), 7 ppm iron (Fe), 5 ppm manganese (Mn), 0.6 ppm copper (Cu), 0.4 ppm boron (B), pH 7.4, and 0.98 percent organic matter. Pre-plant fertilizer was broadcast in on September 8, 2005 to apply 50 lb N/acre, 50 lb P₂O₅/acre, 50 lb SO₄/acre, 50 lb elemental S/acre, 1 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 (SWW) wheat cultivars or lines, 3 of which were club types, and 5 with resistance to imazamox herbicide for use in the BASF "Clearfield[®]" system (designated SWW-CF). Seed was treated with Dividend XL RTA[®] fungicide seed treatment. The experimental design was a randomized complete block with three replications. Grain was planted on October 24, 2005, with a small plot grain drill, in plots 5 by 20 ft, and the field was recorrugated. Seed was planted at a seeding rate of 30 live seed/ft², corresponding to approximately 110 lb/acre. Rainfall in October after planting totaled 0.30 inch and in early November an additional 1.16 inch of rain fell by the time of emergence on November 11. Urea fertilizer was applied by aerial applicator to supply 100 lb N/acre on March 31, 2006.

Broadleaf weeds were controlled with Bronate[®] herbicide at 1qt/acre applied on May 20. Alleys were cut with a sickle bar mower on June 13. Plant height at maturity was measured in the trial on July 10. The alleys were recut with a Hege plot combine on July

17 and the resulting length of each plot was measured and recorded. The plots were harvested on July 18 with a Hege plot combine. Yield and test weight differences were compared using ANOVA and least significant differences at the 5 percent probability level, LSD (0.05). Differences in yield or test weight between varieties should be equal to or greater than the corresponding LSD (0.05) value before any variety is considered different from another in this trial.

Results

The date of 50 percent heading in the Winter Elite Wheat Trial varieties, when half of the culms had extended the peduncle above the collar of the flag leaf, ranged from May 22 (Day of Year [DOY] 142) for 'BZ 6W99-456' to June 4 (DOY 155) for 'OR12042037' (Table 1). Height at maturity ranged from 35 inches tall for 'Gene' to 43 inches tall for 'Tubbs-06', 'Rod', and 'ID99-435'. No lodging was observed in any plots. Test weights in this trial ranged from 64 lb/bu for BZ 6W99-456 to 59 lb/bu for 'Chukar'. Protein content of the grain ranged from 11 percent for Gene to 9 percent for 'ID99-419'.

Yield ranged from 111 bu/acre for 'OR2030411' to 80 bu/acre for 'ARS97135-9' (Table 1). Among the highest yielding wheat varieties were OR2030411, Tubbs-06, 'OR2020787', 'OR2030238', 'OR2010239', 'ID99-419', 'Stephens', 'OR2030239', OR12042037, 'ORH010918', 'ORH010920', 'ORH010083', 'Weatherford', 'ORH010085', Rod, 'ORH010837', 'Idaho 587', 'ORCF-102', 'Madsen', 'OR2010241', and 'OR9901619'. Stephens, a check variety in this trial, and the most commonly grown variety in this production area, continues to show high yield performance, placing it among the top yielding varieties in the trial.

Information on previous wheat trials at Malheur Experiment Station is available on the web at <http://cropinfo.net>. Information on the performance of the varieties in this trial at other Oregon locations is available on the web at http://cropandsoil.oregonstate.edu/wheat/state_performance_data.htm.

Table 1. Winter Elite Wheat Trial market class, yield, test weight, protein, plant height, and 50 percent heading date. Malheur Experiment Station, Oregon State University, Ontario, OR, 2006.

Identification	Market class ^a	Yield bu ^b /acre	Test weight lb/bu	Protein %	Mature height inch	50% heading day of 2006
OR2030411	SWW	111.2	60.9	10.1	38	149
Tubbs-06	SWW	110.0	61.1	9.7	43	145
OR2020787	SWW	109.9	60.9	10.7	39	147
OR2030238	SWW	109.5	60.2	10.1	38	147
OR2010239	SWW	108.5	60.0	9.8	40	152
ID99-419	SWW	106.8	61.5	9.2	40	153
Stephens	SWW	106.6	61.2	10.5	38	145
OR2030239	SWW	106.1	60.3	10.1	38	147
ORI2042037	SWW-CF	105.8	60.8	9.9	41	155
ORH010918	SWW	105.1	61.0	10.3	36	143
ORH010920	SWW	103.3	61.4	10.6	35	144
ORH010083	SWW	102.9	62.1	10.9	38	151
Weatherford	SWW	102.8	61.3	10.0	41	147
ORH010085	SWW	102.1	62.2	10.6	37	150
Rod	SWW	101.2	61.2	9.5	43	150
ORH010837	SWW	99.2	60.6	10.1	36	147
Idaho 587	SWW-CF	99.1	60.8	9.8	39	150
ORCF-102	SWW-CF	99.0	61.0	9.9	41	151
Madsen	SWW	99.0	61.8	10.4	38	150
OR2010241	SWW	97.8	61.7	10.4	40	151
OR9901619	SWW	97.7	60.1	9.7	42	152
Westbred 528	SWW	96.5	62.7	10.4	38	148
OR2030554	SWW	96.4	60.7	9.4	37	151
ORI202183C	SWW-CF	96.1	61.2	10.0	39	150
Masami	SWW	95.1	61.8	9.5	40	148
OR9900553	SWW	95.0	61.1	10.5	37	150
ID99-435	SWW	94.5	61.2	10.1	43	147
ARSC96059-1	SWW	94.3	62.6	9.8	40	150
ID92-22407A	SWW	93.2	61.0	10.1	41	149
Tubbs	SWW	93.2	61.1	9.6	42	150
Brundage 96	SWW	92.3	60.6	9.4	37	147
Chukar	Club	92.1	59.4	9.7	41	154
ORCF-101	SWW-CF	91.3	61.2	10.1	38	150
Gene	SWW	88.8	59.6	11.0	35	144
ORSS-1757	SWW	88.2	60.3	9.5	38	144
Simon	SWW	88.2	61.0	10.1	40	147
BZ 6W99-456	SWW	86.5	63.8	10.6	35	142
Coda	Club	81.8	61.5	9.4	40	154
ARS99123	Club	81.5	61.3	10.7	38	145
ARS97135-9	SWW	80.0	59.6	10.3	38	153
Mean		97.7	61.1	10.1	39	149
LSD ^c (0.05)		14.6	0.05	0.6	2	n/a ^d

^aSWW = Soft white winter, SSWW = Super-soft white winter, SWW-CF = Soft white winter with resistance to imazamox herbicide. ^b60-lb bushel. ^cLeast Significant Difference at α P \leq 0.05.

^dn/a = not applicable.