2018–2019 OREGON WINTER WHEAT ELITE YIELD TRIALS

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Introduction

Malheur Experiment Station serves as one location for the Oregon State University Wheat Elite Yield Trials variety testing program. The Ontario location evaluates the performance of soft and hard winter wheat varieties 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 winter wheat varieties may perform best in their fields.

Materials and Methods

The trial was grown on an Owyhee silt loam in a field previously planted to wheat. After the preceding wheat harvest, the stubble was flailed and the furrows were cleaned. The field was irrigated and then disked. Soil samples were taken from the top foot of soil and analyzed. The analysis showed that the soil contained 20 ppm nitrogen (N), 47 ppm phosphorus (P), 366 ppm potassium (K), 11 ppm sulfur (S), 2,519 ppm calcium (Ca), 451 ppm magnesium (Mg), 53 ppm sodium (Na), 2.0 ppm zinc (Zn), 12 ppm iron (Fe), 6 ppm manganese (Mn), 1.2 ppm copper (Cu), and 0.4 ppm boron (B). The soil pH was 7.3, and it contained 2.90% organic matter.

A broadcast application of pre-plant fertilizer was made with a TerraGator in September. Based on the soil analysis, 50 lb N/acre, 50 lb elemental S/acre, 10 lb Mn/acre, and 2 lb B/acre was applied.

Following the fertilizer application, the soil was deep ripped, plowed, and groundhogged to prepare the seedbed. The field was then corrugated into 30-inch beds.

Grain was planted on October 25, 2018, with a small-plot grain drill at approximately 90 lb/acre (25 live seed per square foot). Plots were 5 ft (2 beds) wide by 20 ft long. The field was corrugated again after planting.

Urea fertilizer was applied on March 18, 2019, by broadcast applicator to supply 217 lb N/acre on the soft white wheat trials and 280 lb N/acre on the hard wheat trial. Broadleaf weeds and wild oat were controlled with GoldSky® (florasulam + fluroxypyr + pyroxsulam) herbicide at 8 fl oz/acre, and Wetcit® adjuvant at 8 fl oz/acre applied on April 4, 2019. The trial was irrigated with furrow irrigation (via gated pipe) in 24-hour sets. The dates of irrigation in 2019 were as follows: May 7, June 4, and June 19. The trials received a total of

9.75 inches of precipitation, including 0.95 inch in one rain event on May 21, 2019. The plots were harvested on July 31, 2019, with a Wintersteiger plot combine.

Results

The trial appeared to be relatively uniform, with good plant growth and performance across the field. Forty-one varieties, including two club types, were evaluated in the Soft Winter Elite Yield Trial, with 21 of the varieties yielding statistically similar amounts of grain (Table 1). Yields in this group ranged from 155.3 to 140.4 bu/acre. The average for the trial was 139.1 bu/acre. Little lodging was observed, with most varieties having less than 5% lodging.

Twenty-four varieties, including four hard white winter (HWW) varieties, were evaluated in the Hard Winter Elite Yield Trial (Table 2). The average yield for the trial was 134.7 bu/acre. Nine of the varieties yielded significantly more wheat than the remaining varieties. Little lodging occurred in most of the varieties. Only three varieties had more than 5% lodging.

Nineteen soft white wheat varieties were evaluated in the Clearfield Winter Elite Yield Trial (Table 3). Eight of the varieties had significantly greater yields than the remaining varieties. Little lodging occurred in most of the varieties. Only five varieties had more than 5% lodging.

These trials are the first elite wheat trials conducted at the Malheur Experiment Station in recent years. Variety performance can change dramatically from year to year, so only limited inferences can be made for this location until data from future years are available. Full data for the OSU Cereal Variety Trials can be found at https://agsci.oregonstate.edu/wheat/osu-wheat-variety-trials.

Table 1. Soft Winter Wheat Elite Yield Trial entries, market class, yield, yield rank, test weight, protein content, and lodging, 2018–2019 growing season, Malheur Experiment Station, Oregon State University, Ontario, OR.

Entry	Variety	Class[a]	Quality[b]	2019 Yield[c]		Test weight	Protein	Lodging
				bu/acre	Rank	lb/bu	%	%
19	LCS Hulk	SWW	A	155.3	1	62.9	9.7	0.0
23	LCS Blackjack	SWW		153.5	2	60.9	8.9	0.0
25	LWW16-71088	SWW		153.4	3	61.7	8.5	7.5
22	LCS Shine	SWW		152.4	4	61.8	9.3	0.0
21	LCS Ghost	SWW		149.8	5	59.2	8.2	2.0
30	SY Raptor	SWW		149.7	6	60.9	9.1	0.8
4	Rosalyn	SWW	A	149.2	7	60.8	8.5	0.0
26	SY Ovation	SWW	D	148.8	8	61.8	8.6	0.0
7	Norwest Duet	SWW	D	148.7	9	62.2	9.8	17.5
24	LWW15-71898	SWW		148.4	10	61	9.1	0.0
16	LCS Artdeco	SWW	A	148.0	11	60.8	9.4	2.5
17	LCS Biancor	SWW		146.8	12	60.9	8.9	0.8
3	Kaseberg	SWW	MD	146.7	13	60.3	8.4	0.0
1	Stephens	SWW	D	144.5	14	61.6	8.9	0.0
2	Mary	SWW	D	144.3	15	62.4	8.2	0.0
31	SY Candor	SWW		143.1	16	61.2	9.3	5.0
29	SY Dayton	SWW	D	142.5	17	62.1	9.1	5.8
6	Norwest Tandem	SWW	A	141.0	18	61.8	9	0.0
14	WB 1604	SWW	A	140.9	19	62.2	9.7	3.8
35	Nixon	SWW		140.7	20	61.5	8.5	0.0
37	OR2140401	SWW		140.4	21	59.5	8.3	0.0
36	OR2130755	SWW		139.5	22	61.6	8.9	2.5
5	Bobtail	SWW	MD	138.0	23	60.0	8.7	2.5
13	WB 1783	SWW	LD	135.8	24	62.7	8.8	6.3
18	LCS Drive	SWW	D	135.4	25	59.0	9.1	0.0
32	06PN212-25	SWW		135.2	26	62.6	8.9	0.0
41	OR2150184	SWW		134.6	27	62.1	9.2	0.0
39	11-163-1C	SWW		134.4	28	62.1	8.6	0.0
28	SY Command	SWW	D	133.5	29	60.1	8.9	7.5
9	IDO 1708	SWW		133.0	30	59.6	8.5	25.0
11	Pritchett	Club	D	132.8	31	61.1	9.1	8.3
33	M-Press	SWW		130.9	32	60.9	8.5	0.0
40	OR2150169	SWW		130.7	33	61.5	9.9	0.0
20	LCS Shark	SWW		129.9	34	60.3	8.6	0.8
34	Dyna-Gro Impact	SWW		127.5	35	62.3	8.5	0.0
27	SY Assure	SWW	A	126.8	36	62.5	10.0	7.5
12	WB 1529	SWW	A	126.3	37	62.1	8.6	0.0
38	OR2140233	SWW		125.7	38	60.5	8.6	6.3
8	VI Bulldog	SWW		123.3	39	61.1	8.7	0.0
15	WB 1532	SWW		121.1	40	61.6	10.7	53.8
10	ARS DH08X117-83C	Club		118.7	41	62.7	9.1	8.8
	Site average			139.1		61.3	9.0	4.3
	LSD (0.05)			15.0		1.0	1.0	13.6
	CV (%)			7.7		1.1	7.9	

[a]SWW = Soft White Winter wheat

[b]Quality rating based on data from the USDA Western Wheat Quality Laboratory: MD = most desirable; D = desirable; A = acceptable; LD = least desirable; UCS = unacceptable except customer-specific uses

[c]Yield data corrected to 12% moisture; grain yields shaded in gray are not significantly different from the highest yield at this site.

Table 2. Hard Winter Elite Yield Trial entries, market class, yield, yield rank, height, test weight, protein content, and lodging, 2018–2019 growing season, Malheur Experiment Station, Oregon State University, Ontario, OR.

Entry	Variety	Class[a]	Quality[b]	2019 Yield[c]		Height	Test weight	Protein	Lodging
				bu/acre	rank	inches	lb/bu	%	%
92	LCS Rocket	HRW	D	149.5	1	32.8	61.9	9.2	0.0
91	LCS Jet	HRW	A	148.6	2	33.0	62.1	9.0	0.0
80	WA 8268	HRW		144.9	3	34.8	62.2	9.6	0.0
93	LCS Aymeric	HRW		142.4	4	31.5	60.5	8.9	0.0
89	WB 4394	HRW		142.0	5	40.0	65.3	9.7	0.0
81	WA 8289	HRW		141.0	6	32.3	62.4	9.4	0.0
101	OR2160011R	HRW		138.9	7	35.5	62.7	9.0	0.0
84	AP Redeye	HRW		138.5	8	35.0	64.0	9.5	2.5
99	OR2150169R	HRW		138.2	9	37.5	62.5	9.2	0.0
96	Millie	HWW		136.1	10	36.3	64.3	10.0	0.8
94	LCS Zoom	HRW		135.5	11	34.3	60.8	9.3	0.0
78	UI Bronze Jade	HWW		134.4	12	41.5	60.9	10.2	16.3
98	OR2160065H	HWW		134.0	13	36.0	63.0	9.9	0.0
100	OR2160008R	HRW		132.1	14	34.3	62.1	9.7	0.0
79	Brawl CL+	HRW		131.2	15	37.5	65.5	11.4	9.5
102	OR2160089R	HRW		130.5	16	33.5	63.4	9.5	0.0
95	Irv	HWW		130.2	17	37.3	62.9	10.1	0.0
87	WB 4303	HRW		129.9	18	35.3	62.8	9.4	0.0
85	Keldin	HRW	A	129.1	19	38.0	63.5	8.8	0.0
90	LCS Evina	HRW	D	128.6	20	40.3	63.1	10.8	0.0
83	Clearstone CL2	HRW		128.1	21	44.5	63.0	10.0	16.3
82	SY Touchstone	HRW	LD	124.7	22	33.3	63.5	9.6	0.0
88	WB 4311	HRW		124.0	23	33.3	64.5	10.4	7.5
86	WB 4623 CLP	HRW	MD	121.2	24	39.5	65.2	10.8	11.3
	Site average			134.7		36.0	62.9	9.7	2.6
	LSD (0.05)			11.7		1.6	0.7	1.1	11.1
	CV (%)			6.2		3.1	0.8	8.3	

[a]HRW = hard red winter wheat; HWW = hard white winter wheat

[b]Quality rating based on data from the USDA Western Wheat Quality Laboratory: MD = most desirable; D = desirable; A = acceptable; LD = least desirable; UCS = unacceptable except customer-specific uses

[c]Yield data corrected to 12% moisture; grain yields shaded in gray are not significantly different from the highest yield at this site.

Table 3. Clearfield Winter Elite Yield Trial entries, market class, yield, yield rank, test weight, protein content, and lodging, 2018–2019 growing season, Malheur Experiment Station, Oregon State University, Ontario, OR.

Entry	Variety	Class[a]	Quality[b]	2019 Yield[c]		Test weight	Protein	Lodging
				bu/acre	Rank	lb/bu	%	%
16	LCS Artdeco*	SWW	A	148.0	1	60.8	9.4	2.5
48	UI Magic CL+	SWW	D	143.1	2	62.3	9.1	5.0
29	SY Dayton*	SWW	D	142.5	3	62.1	9.1	5.8
6	Norwest Tandem*	SWW	A	141.0	4	61.8	9.0	0.0
49	UI Castle CL+	SWW	MD	140.6	5	62.4	9.4	33.8
45	Resilience CL+	SWW	D	139.1	6	61.5	9.2	0.0
5	Bobtail*	SWW	MD	138.0	7	60.0	8.7	2.5
50	UIL 17-6333 CL+	SWW		135.2	8	62.4	9.1	0.0
46	Stingray CL+	SWW		131.7	9	62.0	9.0	0.0
55	ORI2170011 Cl+	SWW		131.2	10	60.5	9.5	0.0
51	UIL 17-6451 CL+	SWW		130.7	11	62.2	8.8	0.0
43	ORCF-102	SWW		128.4	12	61.2	8.5	0.0
54	Appleby CL+	SWW		127.8	13	62.2	9.6	0.0
44	Curiosity CL+	SWW	A	127.3	14	61.3	9.4	77.5
47	WB 1376 CLP	SWW	LD	126.9	15	63.6	9.8	0.0
12	WB 1529*	SWW	A	126.3	16	62.1	8.6	0.0
52	OR 2x2 CL+	SWW		124.2	17	61.3	9.5	0.0
42	ORCF-101	SWW		122.0	18	61.4	8.9	2.5
53	ORI2161244 CL+	SWW		120.5	19	61.5	9.4	0.0
	Site average			133.0		61.7	9.2	6.9
	LSD (0.05)			14.3		1.0	1.0	14.3
	CV (%)			7.7		1.2	7.6	

[a]SWW = soft white winter wheat
[b]Quality rating based on data from the USDA Western Wheat Quality Laboratory: MD = most desirable; D = desirable; A = acceptable; LD = least desirable; UCS = unacceptable except customer-specific uses.
[c]Yield data corrected to 12% moisture; grain yields shaded in gray are not significantly different from the highest yield at this site.
*Indicates check variety.