

## FACT SHEET

**Selection OR880172**  
Soft White Winter Wheat  
PROPOSED NAME: FOOTE

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### Description

Selection OR880172 is a soft white common winter wheat. It is a semi-dwarf with white, stiff straw. The spike is awned, oblong, dense, and nodding. Glumes are glabrous, white, mid long; shoulders narrow, wanting; beaks narrow, acuminate, 2 to 3 mm. Awns are 2 to 7 cm long. The kernels are white, midlong, soft, elliptical with midsize germ and a narrow, shallow crease. The brush is small.

### Pedigree and History

Selection OR880172 was developed from a complex cross Heima//Kalyansona/Bluebird/3/WWP7147, F<sub>1</sub>/4/D6301/Heines VII//ERA/3/Buckbuck. The initial single cross was made by International Maize and Wheat Improvement Center scientists in Mexico. Subsequent crosses were carried out at the Hyslop Crop Science Laboratory. Thus, the pedigree of OR880172 represents a combination of winter and spring type parents. The original selection was obtained from F<sub>3</sub> head row, which traces back to an individual F<sub>2</sub> plant. Additional selections were made in F<sub>4</sub>, F<sub>5</sub>, with phenotypically similar F<sub>6</sub> head rows bulked for yield evaluation. Following yield, disease and quality evaluations, head rows were again reselected in 1996 for seed increase. Additional spikes were selected and sent to the crop improvement program at Washington State University for the production of breeders seed.

### Area of Adaptation

Selection OR880172 is widely adapted to most winter wheat growing areas in the Pacific Northwest; however, it is superior yield-wise to existing cultivars only in the Willamette Valley and areas where Septoria tritici is a major limiting factor.

### Disease Reaction

Selection OR880172 is resistant to Leaf Blotch (Septoria tritici), Mildew (Erysiphe graminis f. sp. tritici), Stripe Rust (Puccinia striiformis), Leaf Rust (Puccinia recondita f. sp. tritici), Columbia Basin Foot Rot (Pseudocercospora herpotrichoides), and Common Bunt (Tilletia caries) and T. foetida (Table 1).

### Agronomic Traits

Data for selected agronomic traits are provided in Table 2. When compared to Stephens and Madsen, Selection OR880172 is similar to Stephens in heading date, taller than either cultivar, slightly weaker strawed, lower phenotypic score on overall appearance, and similar to Stephens in winterhardiness.

### Yield Performance

Selection OR880172 has been in Oregon elite yield trials for five years. As seen in Table 3, OR880172 is adapted to the Willamette Valley where it has yielded, on the average, 10 bushels more per acre than Madsen and 38 bushels more than Stephens. It has yielded less than Stephens and Madsen at both the Rugg's and Moro eastern Oregon sites.

OR880172 has been in the regional nursery grown at experimental sites in Washington, Idaho and Oregon for three years. Data for two years are provided in Table 4. When compared to the check Stephens overall locations, OR880172 in both 1994 and 1995, has yielded slightly less.

### Quality Data

Selection OR880172 is very similar in its overall quality properties to Stephens and Madsen. Despite considerable genotype x environment interactions involving these traits, OR880172 has softer kernels and superior sponge cake volume and sponge cake score. The quality information was provided by the Western Regional Wheat Quality Laboratory located at Pullman, Washington (Table 5).

Table 1. Disease data of OR88172 compared with Stephens and Madsen.

Variety	Septoria	Foot rot	Mildew	Stripe rust	Leaf rust	Common bunt
Stephens	7	M	R	MR	MR	R
Madsen	4	R	R	R	MR	R
OR880172	1	M	R	R	MR	R

Table 2. Agronomic data for OR880172 compared with Stephens and Madsen.

Variety	Heading Julian date *	Height cm	Lodging Corvallis	Ag. Score	Winterhardiness (1-5)**
	4 yr Average	3 yr Average			
Stephens	139	102	0	2	3
Madsen	144	102	0	2	2
OR880172	140	114	5	3	3

\* Julian date = number of days from January 1

\*\* 1 being the most winter hardy

Table 3. Yield (bu/acre) of OR880172 compared with Stephens and Madsen.

Variety	# of yrs tested	Rugg's	Corvallis	Moro
Stephens	5	103	89	89
Madsen	5	116	117	84
OR880172	5	98	127	68

Table 4. Data from the Western Regional Uniform White Winter Wheat Nursery.

Variety	1994 Bu/ac	1995 Bu/ac
OR880172	94.4	98.4
Stephens	97.2	100.0

Table 5. Grain quality, milling quality and end-use quality of OR880172 compared with Stephens and Madsen.

OR880172 Analysis of Variance

Means, LSD, Probability and Number of Paired Comparisons by Genotype

Grain Quality

Genotype	Test weight	Grain protein	Grain hardness
OR880172	61.5	10.8	26
STEPHENS	60.8	10.3	34
LSD	0.9	0.6	6.0
P-VALUE	0.14	0.10	0.02
N	13.0	11.0	6.0
OR880172	60.9	10.6	25
MADSEN	61.1	10.7	40
LSD	0.4	0.8	3.0
P-VALUE	0.38	0.63	<.01
N	7.0	7.0	5.0

Milling and Flour Quality

Genotype	Flour yield	Flour ash	Milling score	Flour protein	Flour Viscosity
OR880172	73.5	0.36	88.0	9.0	76
STEPHENS	73.6	0.38	86.8	8.9	77
LSD	0.8	0.02	2.0	0.5	44
P-VALUE	0.86	0.06	0.23	0.51	0.90
N	12	12	12	12	2
OR880172	74.1	0.37	87.7	9.1	76
MADSEN	74.9	0.38	88.9	9.2	81
LSD	1.0	0.03	2.0	0.7	44
P-VALUE	0.06	0.47	0.18	0.71	0.40
N	6	6	6	6	2

End-Use Quality

Genotype	Mixograph water absorption	Cookie diameter	Top grain score	Sponge cake volume	Sponge cake score
OR880172	54.1	8.7	5.5	1263	72
STEPHENS	54.5	8.6	6.1	1219	68
LSD	1.5	0.2	1.1	52	3
P-VALUE	0.54	0.37	0.31	0.09	0.02
N	12	12	11	8	8
OR880172	54.1	8.6	5.2	1259	71
MADSEN	54.7	8.4	5.3	1204	67
LSD	1.7	0.3	1.7	98	6
P-VALUE	0.38	0.27	0.80	0.19	0.13
N	6	6	6	5	5

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WHEAT RESEARCH

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TO: Ron Cook, Oregon Seed Certification  
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RE: Variant statement for the variety 'Foote'

FROM: C. James Peterson *C. Peterson*  
Professor, Wheat Breeding and Genetics

The 2002-03 Foundation Seed increase of Foote was found to contain 1 red wheat seed per pound. In his search for a variant description through WSCIA and Oregon Seed Certification records, Greg Vollmer has found that no variant statement was ever written for the variety.

Lot OR172-BR, provided by OSU, was the basis of all increases of the variety Foote. Greg sent a fax to Warren Kronstad and Mary Verhoeven on 10/3/97 stating that red wheat had been found in breeder seed of the numbered selections OR898120, 92CW054, and OR880172. A variant statement likely was not written for OR880172 (Foote) at that time as that the first foundation lot (W118-1) produced in 1998 from lot OR172-BR did not show a red wheat variant. Also, the decision had been made to not PVP Foote, so there was less concern at the time over drafting of a variant statement.

In 2002, seed lot W118-1 seed was planted to produce W113-1. After harvest in summer 2003, WSDA found 1 red wheat seed per pound (WSDA seed test 3-1816) in lot W113-1. Another 1000g. seed examination was performed on a precleaned sample of W113-1 (WSDA test 3-1348) and red wheat was not found.

There is no doubt that a red wheat variant has been present at some low level in Foote since the original breeder seed was produced and provided to the WSCIA Foundation Seed Program. Some height variation also exists in the variety and should be more clearly described.

A variant description for Foote is provided as follows:

**Variants which are 4" to 8" taller than the normal canopy height may be observed under higher yielding conditions. Other than height, the taller variants appear to be similar in appearance (head type, maturity, chaff color, etc.) to other plants in the field. Seed of Foote may contain red kernels which may be detected visually and by chemical testing. The red kernel variants may not exceed five per pound in foundation, registered and certified classes of seed.**

Note that the red wheat variant level is similar to that of many other major PNW varieties, including Madsen and Madsen derivatives such as Weatherford and Tubbs. Please don't hesitate to contact me if you have any questions or comments.

Cc: Doug Boze, WSCIA  
John Zielinski, Oregon Seed Certification