



ORSS-1757

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“SuperSoft” Soft White Winter Wheat

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Variety Description

‘ORSS-1757’ is a common soft white winter wheat developed by Oregon State University in cooperation with the USDA Agricultural Research Service (USDA-ARS). It is an awned semidwarf variety with high yield potential, early to midseason maturity, and superior end-use quality.

ORSS-1757 is resistant to current races of stripe rust (*Puccinia striiformis*) and moderately resistant to Septoria leaf blotch. It is tolerant to *Fusarium* crown rot (dryland foot rot) and *Cephalosporium* stripe. ORSS-1757 is susceptible to *Pseudocercospora* strawbreaker (eyespot) foot rot and moderately susceptible to wind shatter.

Area of Adaptation

ORSS-1757 is best adapted to the dryland wheat-growing regions of Wasco, Sherman, Gilliam, and Morrow counties in north central Oregon (figure 1, blue-shaded regions). It is also adapted to the larger wheat-growing regions of northeast and western Oregon (figure 1, red-shaded regions).

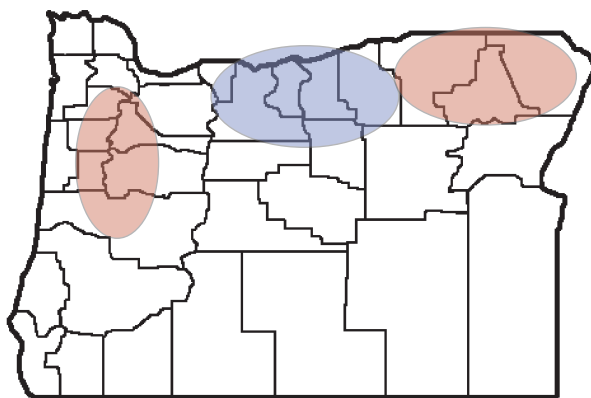


Figure 1. Regions of Oregon where ORSS-1757 is best adapted (blue) and secondary regions of adaptation where ORSS-1757 can be grown (red).



Figure 2. ORSS-1757 wheat.

Year Released

ORSS-1757 was released in 2005 and is protected under the Plant Variety Protection Act with the Title 5 option.

Agronomic Characteristics

Height and Lodging Resistance

In trials over 31 site-years in Oregon, the plant height of ORSS-1757 averaged 34.7 inches (table 1). Its height is similar to that of Brundage 96 and Westbred 528. ORSS-1757 is approximately 1 to 2 inches shorter than AP 700 CL, ORCF-102, Salute, Tubbs 06, and Xerpha and approximately 1 to 2 inches taller than Madsen, ORCF-101, Goetze, Skiles, and Stephens. Straw strength of ORSS-1757 is moderate, and lodging has been observed in irrigated and high rainfall production environments.

Table 1. Grain yield and agronomic data for 13 soft white winter wheat varieties grown across a range of environments in Oregon, 2007–2009.

| Variety | Grain yield (bu/acre) | | Agronomic data | | | |
|-------------------------|---------------------------------|-------------------------------------|----------------------------|------------------------------|-----------------------------|-----------------------------|
| | North central Oregon dryland | Oregon Winter Elite Yield Trials | Test weight 3-year mean | Grain protein 3-year mean | Plant height 3-year mean | Heading date 3-year mean |
| | 3-year mean | 3-year mean | 31 site-years | 31 site-years | 31 site-years | 18 site-years |
| | 12 site-years | 31 site-years | (lb/bu) | (%) | (in.) | (DOY) ^a |
| ORSS-1757 | 54.8 | 88.1 | 59.7 | 9.2 | 34.7 | 145.8 |
| AP 700 CL | 56.7 | 92.4 | 59.9 | 10.0 | 35.8 | 146.3 |
| Brundage 96 | 54.0 | 91.7 | 59.9 | 9.7 | 34.2 | 147.4 |
| Goetze | 57.9 | 93.5 | 59.5 | 9.6 | 32.1 | 143.2 |
| Madsen | 52.0 | 86.0 | 60.0 | 10.2 | 33.7 | 149.6 |
| ORCF-101 | 53.5 | 86.9 | 59.7 | 10.2 | 33.9 | 147.1 |
| ORCF-102 | 57.2 | 94.2 | 60.3 | 9.9 | 35.9 | 147.6 |
| Salute | 56.4 | 93.1 | 59.0 | 9.8 | 35.7 | 147.0 |
| Skiles | 57.5 | 93.1 | 60.9 | 10.0 | 33.1 | 146.6 |
| Stephens | 53.2 | 89.5 | 59.4 | 10.0 | 33.4 | 144.9 |
| Tubbs 06 | 55.9 | 94.1 | 59.1 | 9.6 | 36.8 | 147.0 |
| Westbred 528 | 57.9 | 96.2 | 61.2 | 10.0 | 34.2 | 144.5 |
| Xerpha | 58.1 | 93.8 | 59.6 | 9.4 | 35.7 | 149.8 |
| Mean | 55.8 | 91.7 | 59.9 | 9.8 | 34.6 | 146.7 |
| LSD ^b (0.05) | 2.9 | 2.7 | 0.3 | 0.2 | 0.4 | 0.4 |
| CV ^c (%) | 11.1 | 10.5 | 1.7 | 8.4 | 4.3 | 0.7 |

^a Day of year.

^b Least significant difference.

^c Coefficient of variation.



Maturity

ORSS-1757 is an early to midseason-maturing variety, similar to Stephens. It heads approximately 2 days later than Goetze and 2 days earlier than ORCF-101, ORCF-102, and Tubbs 06 (table 1).

Vernalization and Cold Tolerance

ORSS-1757 is a winter wheat that requires vernalization to initiate flowering. Crown freezing tests (a measure of cold tolerance) conducted by the USDA-ARS have shown that the cold tolerance of ORSS-1757 is similar to that of Stephens (table 2). Under normal conditions, growers in Oregon are unlikely to observe winter injury.

Disease Resistance

ORSS-1757 is resistant to current races of stripe rust (*Puccinia striiformis*) and moderately resistant to Septoria leaf blotch (table 2). It is moderately resistant/susceptible to *Fusarium* crown rot (dryland foot rot) and *Cephalosporium* stripe and susceptible to *Pseudocercospora* strawbreaker (eyespot) foot rot. A fungicidal seed treatment is recommended to control common bunt and other seedborne diseases.

Table 2. Agronomic and disease ratings for 13 soft white winter wheat varieties grown in Oregon.

| Variety | Maturity | Winter hardiness ^a | Rust ^b | | | Crown rot ^b | <i>Cephalosporium</i> stripe ^b | Strawbreaker foot rot <i>Pseudocercospora</i> ^b |
|--------------|-----------|-------------------------------|-------------------|------|-----------------------|------------------------|---|--|
| | | | Stripe | Leaf | Septoria ^b | | | |
| ORSS-1757 | Early-mid | 3 | R | | MR | MR/MS | MR/MS | S |
| AP 700 CL | Midseason | 5 | MR | R | MR | S | S | MR/MS |
| Brundage 96 | Midseason | 5 | MR | MS | MS | MS/MR | MS | S |
| Goetze | Early-mid | 2 | S/MR ^c | MR | | MS | MS | MR/MS |
| Madsen | Midseason | 5 | R | MR | S | MR/MS | MR | R |
| ORCF-101 | Midseason | 3 | MR/MS | MS | S | MS | S | S |
| ORCF-102 | Midseason | 4 | R/MR | MR | MR/MS | MR/MS | MR/MS | R |
| Salute | Midseason | 5 | R | | MR | S | MS | S |
| Skiles | Midseason | 7 | R | | | MR | MR | S |
| Stephens | Early-mid | 3 | R | S | S | S | S | S |
| Tubbs-06 | Midseason | 5 | MR/MS | MS | MR/MS | S | S | R |
| Westbred 528 | Early-mid | 4 | MS/MR | MS | MS | MS/S | S | S |
| Xerpha | Midseason | 7 | MR | | MR | MR/MS | MR/MS | S |

Data were compiled from the following sources: *Winter Grain Varieties for 2003*, Special report 775, Oregon State University Extension Service; 2004–2010 Oregon Winter Elite Yield Trial Disease Ratings; and *Variety Characteristics*, Washington State Crop Improvement Association.

^a Scale: 1 to 10 (10 = excellent; 1 = poor).

^b Scale: R = resistant; MR = moderately resistant; MS = moderately susceptible; S = susceptible.

^c Goetze is susceptible to stripe rust during the seedling stage but moderately resistant as an adult plant.



Yield

ORSS-1757 has shown high yield potential across a range of environments in Oregon. ORSS-1757 averaged 54.8 bushels per acre in its primary production zone (Wasco, Sherman, Gilliam, and Morrow counties in north central Oregon), compared with 57.9, 52.0, 53.5, 57.2, 57.5, 53.2, and 55.9 bushels per acre for Goetze, Madsen, ORCF-101, ORCF-102, Skiles, Stephens, and Tubbs 06, respectively (table 1).

In 31 site-years of Oregon Winter Elite Yield Trials, ORSS-1757 averaged 88.1 bushels per acre, compared with 92.4, 91.7, 93.5, 86.0, 86.9, 94.2, 93.1, 93.1, 89.5, 94.1, 96.2, and 93.8 bushels per acre for AP 700 CL, Brundage 96, Goetze, Madsen, ORCF-101, ORCF-102, Salute, Skiles, Stephens, Tubbs 06, Westbred 528, and Xerpha, respectively (table 1).

Test Weight and Quality

Test weight of ORSS-1757 averaged 59.7 pounds per bushel across 31 site-years in Oregon (table 1). This is similar to test weights for AP 700 CL, Brundage 96, Goetze, Madsen, ORCF-101, Stephens, and Xerpha.

Grain protein of ORSS-1757 averaged 9.2% in Oregon (table 1). This is approximately 0.5 to 1 percentage points lower than grain protein values of AP 700 CL, Brundage 96, Goetze, Madsen, ORCF-101, ORCF-102, Salute, Skiles, Stephens, Tubbs 06, and Westbred 528.

Milling and baking evaluations conducted by the USDA-ARS Western Wheat Quality Laboratory and the Pacific Northwest Wheat Quality Council suggest that ORSS-1757 is superior to Stephens and acceptable for a soft white winter wheat (table 3). ORSS-1757 is unique in that it has a very soft kernel texture. Grain hardness values for ORSS-1757 were 14 and 22 points lower than those for Stephens and Tubbs 06, respectively, when measured with the Pertin Single Kernel Characterization System.

Table 3. End-use quality analyses of ORSS-1757 soft white winter wheat in paired comparisons with Stephens and Tubbs 06.

| Variety | Kernel hardness (SKCS) ^a | Break flour yield (%) | Flour yield (%) | Flour ash (%) | Milling score | Flour protein (%) | Mix absorption (%) | Cookie diameter (cm) |
|-----------|-------------------------------------|-----------------------|-----------------|---------------|---------------|-------------------|--------------------|----------------------|
| ORSS-1757 | 19.8* | 51.9* | 69.2 | 0.40 | 84.1 | 8.0* | 54.4* | 9.6* |
| Stephens | 33.9 | 48.0 | 69.7 | 0.40 | 84.2 | 9.2 | 55.3 | 9.3 |
| ORSS-1757 | 22.4* | 52.0* | 70.5 | 0.40* | 85.6* | 7.9 | 53.9 | 9.5* |
| Tubbs 06 | 44.8 | 48.4 | 71.0 | 0.43 | 84.3 | 8.2 | 54.4 | 9.2 |

Data were provided by the USDA-ARS Western Wheat Quality Laboratory, Pullman, Washington.

^a Single Kernel Characterization System.

* Statistically significant difference ($p < 0.05$), based on a paired t -test.



Average break flour yields for ORSS-1757 were higher than those for Stephens and Tubbs 06, and the milling score for ORSS-1757 was superior to that for Tubbs 06 and similar to that for Stephens. Flour protein content for ORSS-1757 was lower than that for Stephens and similar to that for Tubbs 06. Mix absorption of ORSS-1757 was similar to that of Tubbs 06 and 0.9% less than that of Stephens. The average cookie spread for ORSS-1757 was 0.3 centimeters greater than that for Stephens and Tubbs 06.



Figure 3. Production of ORSS-1757 (in headrows) for seed.

Development

ORSS-1757 was derived from a complex spring-by-winter cross (Yamhill/Hyslop//Stephens/3/OR7946/Hill//Hill (as selection WSQ910137)/4/Sambo/Heine 4//Stephens/3/Wattines//Yamhill/Hyslop) made in 1992 at the OSU Hyslop Field research farm near Corvallis, Oregon. Sambo is a winter wheat from the Netherlands, and Wattines is a winter wheat from France. ORSS-1757 is an F_5 -derived line that was identified as a headrow in 1997 at Pendleton, Oregon. The selection was evaluated under experimental number OR9801757.

Seed Availability

Breeder and Foundation seed will be maintained by the Washington State Crop Improvement Association. ORSS-1757 is protected under U.S. Plant Variety Protection with the Title 5 option (PVP 200500336). Certification classes recognized for ORSS-1757 include Foundation, Registered, and Certified.

Seed of ORSS-1757 has been deposited in the USDA National Small Grains Collection in Aberdeen, Idaho (PI 641786). It is requested that the source of this material be acknowledged in future use by wheat breeding and genetics programs.

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