

OREGON AGRICULTURAL EXPERIMENT STATION
OREGON STATE UNIVERSITY
CORVALLIS, OR 97331

Release of 'Tubbs' soft white winter wheat

'Tubbs' (PI 629114) is a soft white winter wheat (*Triticum aestivum* L.) developed by Oregon State University for release in cooperation with USDA-Agricultural Research Service, Washington State University, and University of Idaho. Tubbs is being released for its superior yield potential and broad adaptation to wheat growing areas of the Pacific Northwest. The name was chosen to recognize the leadership and contributions of Frank Tubbs to the Oregon wheat industry.

Tubbs is a semidwarf soft white winter wheat derived from the cross 'Madsen'/'Malcolm' made in 1990. Tubbs is an F₃-derived line, which was identified in 1994 as an F₄ headrow and designated as experimental number OR939526 in 1995.

Tubbs has broad adaptation to production areas of northeast Oregon, southeast Washington, and Idaho. Tubbs carries resistance to strawbreaker footrot (*Pseudocercospora herpotrichoides* (Fron.) Deighton) from the parent variety Madsen and has a similar reaction to this important disease. It is moderately susceptible to Septoria leaf blotch (*Septoria tritici* Roberge in Desmaz.) and has acceptable levels of resistance to leaf rust (*Puccinia triticina* Eriks.). It is susceptible to Cephalosporium stripe (*Cephalosporium gramineum* Nis.& Ika.), with reaction similar to Stephens, and is moderately resistant to crown rot (*Fusarium pseudograminearum* O'Donnell et. T. Aoki sp. nov.). Tubbs is resistant to common bunt (*Tilletia tritici* (Bjerk.) G. Wint. in Rabenh) and susceptible to dwarf bunt (*Tilletia controversa* Kühn in Rabenh).

In USDA-ARS stripe rust (*Puccinia striiformis* Westend.) evaluations, Tubbs has shown susceptible infection response, but with generally intermediate to low infection intensities. Field infection ratings for Tubbs have been higher than for Stephens, Madsen, or Weatherford, but significantly lower than ratings for susceptible varieties such as 'Brundage'. Tubbs has shown intermediate to high levels of stripe rust infection in the Skagit Valley. However, the high disease intensities at this location are not a good indication of field response east of the Cascades. The relatively low

disease progress in other test sites suggests that Tubbs carries adequate adult plant resistance for eastern Oregon and Washington production areas.

Tubbs averages 2 d later in heading date than Stephens and 2 d earlier than Weatherford. Plant height averages 2 inches taller than Stephens and 1.3 inches taller than Madsen. Tubbs has good straw strength and lodging resistance has been comparable to Weatherford. Crown freezing tests conducted by USDA-ARS suggest that Tubbs has cold-tolerance, or winterhardiness, comparable to Stephens, Madsen, and Weatherford.

Tubbs was evaluated in the USDA-ARS Western Regional Uniform Soft Wheat Nursery in 1999 and 2000, the Oregon State-wide Variety Trials in 1999 through 2001, and in the Washington and Idaho State Variety Trials in 2000 and 2001. Grain yields of Tubbs have consistently exceeded those of the check varieties Stephens, Weatherford, and Madsen. Over 120 site/years of testing, Tubbs has averaged 107.7 bu/a grain yield compared with 99.6 bu/a for Stephens and 99.8 bu/a for Madsen. In 91 site/years of testing, Tubbs has averaged 103.3 bu/a compared with Weatherford at 99.7 bu/a.

Over 60 locations in 2000 and 2001, test weight of Tubbs averaged 0.3 lb/bu lower than Stephens and 0.8 lb/bu lower than Madsen. Thousand kernel weight of Tubbs has averaged 39.4 g over 3 years of Oregon State Variety Trials; higher than kernel weight of Madsen at 35.4 g, but lower than Stephens at 41.9 g. Grain protein content of Tubbs has averaged 0.4 percentage points lower than both Madsen and Stephens.

End-use quality of Tubbs has been evaluated annually through the ARS Western Wheat Quality Lab since 1995. Comparisons of milling quality, flour yield, protein content, and baking evaluations suggests that Tubbs has quality attributes very similar to Stephens, Weatherford, and Madsen and is considered as acceptable for soft wheat applications. Milling quality, as indicated by break flour yield, and water absorption is similar to Stephens, Madsen, and Weatherford. Tubbs has cookie diameter similar to Weatherford, but slightly smaller than diameter for Stephens and Madsen. Sponge cake volume is similar to that of the three check varieties. Tubbs was evaluated in the 1999 Pacific Northwest Wheat Quality Council trials and was considered by industry collaborators as generally acceptable for major soft wheat product applications.

In fall 2000, 1,500 heads of Tubbs were threshed, screened for seed color and seed size, and provided to Washington Foundation Seed for production of Breeder seed. These were planted as individual headrows and off-type rows were removed prior to bulk harvest of Breeder seed. Foundation seed will be available in August, 2002. Tubbs will be submitted for Plant Variety Protection, but without the Title 5 option. Seed of Tubbs has been deposited in the USDA National Small Grains Collection, Aberdeen, Idaho. It is requested that the source of this material be acknowledged in future use by wheat breeding and genetics programs.

C.J. Peterson*, W.E. Kronstad, M. Verhoeven, M. Larson,
B. Hoefler, R. Karow, J. Bassinette, C. Morris, D. Engle,
C. Mundt, R. Smiley, R. Line, and Z. Chen