

WASHINGTON AGRICULTURAL RESEARCH CENTER  
WASHINGTON STATE UNIVERSITY  
PULLMAN, WASHINGTON 99164

and

UNITED STATES DEPARTMENT OF AGRICULTURE  
AGRICULTURAL RESEARCH SERVICE  
WASHINGTON, D.C. 20250

**NOTICE OF RELEASE OF 'BAUERMEISTER'  
Hard Red Winter Wheat**

'Bauermeister' (J981107, WA007939) hard red winter wheat (HRW)(*Triticum aestivum* L.) (Reg. No. CV-XXX, PI 634717) was released in 2005 by the Washington Agricultural Research Center. Bauermeister is a semidwarf cultivar adapted to the low-to intermediate-rainfall (<460 mm average annual precipitation) HRW wheat growing regions of Washington State. It was released for its high grain yield, stripe rust resistance and superior quality attributes. Bauermeister is named in honor of Dale and Dan Bauermeister, wheat producers from Connell, WA. The Bauermeisters are strong supporters of Washington State University (WSU) wheat research and have cooperated with WSU for many years toward the improvement of winter wheat for the low rainfall areas of the State of Washington.

Stephen Jones selected Bauermeister ['TAM200' (PI 578255)/ 3\*'Eltan' (PI 536994)] in the BC<sub>3</sub>F<sub>6</sub>. The pedigree of TAM200 (HRW) is TX391-56-D8/'Tascosa' (Cltr 13023)//'Centurk' (Cltr 15075))\*3/ 'Amigo' (PI 578213) = (Sturdy sib/Tascosa//Centurk)\*3/Amigo, and the pedigree of Eltan (soft white winter) is 'Luke' (Cltr 14586)//BR-70443-4 (PI 167822) / 'Sel.101' (Cltr 13438). The original cross and subsequent backcrosses were made in the WSU Wheat Plant Growth Center. Plants of the BC<sub>3</sub>F<sub>1</sub> were harvested in bulk and planted in the field at Pullman, WA in 1998. BC<sub>3</sub>F<sub>2</sub> and BC<sub>3</sub>F<sub>3</sub> were managed as bulk populations. BC<sub>3</sub>F<sub>4</sub> plots were selected for general adaptation, maturity, resistance to stripe rust (caused by *Puccinia striiformis* Westend.), grain yield and test weight. Approximately 100 single spikes were randomly harvested from the selected BC<sub>3</sub>F<sub>4</sub> plots. BC<sub>3</sub>F<sub>4.5</sub> head rows were bulk harvested and seed hardness was determined for each head row. BC<sub>3</sub>F<sub>4.6</sub> seed from head rows that were hard (> 70 single kernel hardness) and red were then bulked for each head row and planted as individual breeding lines in replicated yield trials. BC<sub>3</sub>F<sub>2</sub> - BC<sub>3</sub>F<sub>5</sub> progeny were advanced in field nurseries in Pullman, WA while subsequent generations were advanced in replicated yield trials throughout Washington State. Breeder seed of Bauermeister was produced in 2004 from 2000 BC<sub>3</sub>F<sub>4.8</sub> heads selected from a pure seed increase at Pullman, WA and planted in head rows under irrigation at Othello, WA.

Bauermeister has an awned lax spike with long midwide, white glumes. The kernels are elliptical, red, hard, and midlong, with a shallow crease. The germ is midsized.

Bauermeister exhibits resistance to snow mold (caused by *Typhula idahoensis* Rems and *T. ishikariensis* Imai.) and stripe rust (caused by *Puccinia striiformis* Westend f. sp. *tritici*.) similar to Eltan. Bauermeister was tested for stripe rust in various field nurseries under natural infection across Washington State in 2002 to 2004. Stripe rust was well developed in all locations in each of the three years. In most tests, Bauermeister had infection types (ITs) from 0 (no symptom) to 5 (moderately resistant). In a few tests it had IT 8 (moderately susceptible) or mixed ITs, but with severity never beyond 40%. Thus, Bauermeister has adequate resistance to stripe rust in the fields. In greenhouse seedling stripe rust tests performed under low temperature cycle (diurnal temperature gradually changing from 4°C at 2:00 am to 20°C at 2:00 pm), Bauermeister showed resistance to race PST-21, intermediate resistance to races PST-41 and 95, and susceptibility to races PST-17, 37, 43, 45, 58, 78, 79, 97, 98, 100 and 105 of *Puccinia striiformis* f. sp. *tritici*. In greenhouse adult-plant stripe rust tests performed under high temperature cycle (diurnal cycle gradually changing from 10°C at 2:00 am to 35°C at 2:00 pm), Bauermeister had resistant to moderately resistant reactions to races PST-37, 43, 58, 97, 98 and 100 of *Puccinia striiformis* f. sp. *tritici*. The contrasting reactions of the adult-plant vs. seedling tests indicate Bauermeister has an adequate level of non-race specific high-temperature adult-plant resistance for the Pacific Northwest wheat production regions. Bauermeister showed moderate resistance to dwarf bunt (caused by *Tilletia controversa* Kühn) differentials Bt3, Bt9, and Bt10 in inoculated field trials. Visual disease assessments in inoculated field trials indicate Bauermeister is moderately susceptible to Cephalosporium stripe (caused by *Cephalosporium gramineum* Nis. & Ika), similar to Eltan, and moderately susceptible to eyespot foot rot (caused by *Tapesia yallundae* Wallwork and Spooner = *Pseudocercospora herpotrichoides* (Fron.) Deighton), slightly better than Eltan. In naturally infected fields, visual disease assessments show Bauermeister slightly susceptible to powdery mildew (caused by *Blumeria graminis* (DC.) Golovin ex Speer (syn. *Erysiphe graminis* DC.) f. sp. *tritici* Em Marchal) but it has exhibited no susceptibility to leaf rust (caused by *Puccinia triticina* Eriks: syn. *Puccinia recondita* Roberge ex Desmaz. f. sp. *tritici* Eriks. and E. Henn.).

Grain yields of Bauermeister typically exceed those of 'Finley' (PI 586757) (Donaldson et al., 2000), 'Weston' (Cltr 17727) and 'Buchanan' (PI 532994) (Donaldson, 1993). In 13 rain fed trials in the low to intermediate precipitation zones (<460 mm annual precipitation) in Washington State conducted from 2002 to 2004, grain yields of Bauermeister, Finley, Buchanan and Weston were 4038 kg ha<sup>-1</sup>, 3568 kg ha<sup>-1</sup>, 3514 kg ha<sup>-1</sup>, and 3595 kg ha<sup>-1</sup>, respectively. Grain volume weight of Bauermeister (760 g L<sup>-1</sup>) is similar to Buchanan (758 g L<sup>-1</sup>), and slightly less than Finley (783 g L<sup>-1</sup>) and Weston (783 g L<sup>-1</sup>). In artificial freeze tests conducted in growth chambers at the WSU Wheat Plant Growth Center, the LD<sub>50</sub> (temperature at which 50% of fully hardened plants survived) of Bauermeister was -13.6°C, similar to Finley (-13.7°C) and Weston (-13.5°C). It typically heads about 140 d of year, 2 d later than Finley. The average thousand-kernel weight of Bauermeister is (35.3 g), less than Weston (40.4 g), Buchanan (44.5 g) and Finley (47.0 g). The average plant height of Bauermeister is 92 cm, shorter than Finley (110 cm), Weston (106 cm) and Buchanan (102 cm). Its

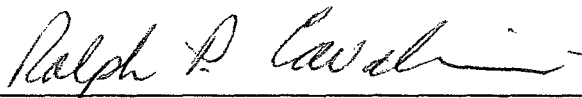
coleoptile length (73mm) is slightly less than Finley (81 mm), but field observations note it emerges 1-2 d earlier than Finley while final stand counts are similar.

Milling and baking evaluations were conducted by the USDA-ARS Western Wheat Quality Lab in Pullman, WA using grain produced in rain fed breeding and commercial variety testing trials in Washington State from 2003 and 2004. Results from quality assessments were averaged over all trials in which Bauermeister and the cultivars Finley (n=19), 'Hatton' (Cltr 17772) (n=8) and Weston (n=6) were grown. Bauermeister had milling yields of 65.9 g kg<sup>-1</sup>, 65.6 g kg<sup>-1</sup> and 63.9 g kg<sup>-1</sup> similar to Weston (64.6 g kg<sup>-1</sup>) and Hatton (66.9 g kg<sup>-1</sup>), but less than Finley (66.7 g kg<sup>-1</sup>), respectively. Bauermeister dough mix time (3.6 min.) is longer than Weston (2.4 min), Hatton (2.8 min.) and Finley (2.9 min.). Bauermeister had an average flour protein concentration of 107 g kg<sup>-1</sup> and loaf volume of 866 mL, similar to Hatton (110 g kg<sup>-1</sup> flour protein concentration, 892 mL loaf volume). When compared to Finley (116 g kg<sup>-1</sup> flour protein concentration, 966 mL loaf volume) and Weston (115 g kg<sup>-1</sup> flour protein concentration, 961 mL loaf volume) Bauermeister had a flour protein concentration and loaf volume of 111 g kg<sup>-1</sup>, 878 mL and 101 g kg<sup>-1</sup> and 824mL, respectively.

Bauermeister will be protected by US plant variety protection. Seed of Bauermeister will be maintained by the WA State Crop Improvement Association under supervision of the Department of Crop and Soil Sciences and the Washington State Agricultural Research Center and may be obtained by contacting the corresponding author or through the National Small Grains Germplasm Collection of the National Plant Germplasm System ([http://www.ars-grin.gov/npgs/\[homepage\]](http://www.ars-grin.gov/npgs/[homepage])).

#### References

- Donaldson, E., B. Sauer, S.R. Lyon, C.F. Morris, R.F. Line. 2000. Registration of Finley wheat. *Crop Sci* 40(4):1197.
- Donaldson, E. 1993. Registration of Buchanan wheat. *Crop Sci* 33(4):878.



Director, Washington Agricultural Research Center  
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July 13, 2006  
Date

Yes, the USDA-ARS wishes to join in the release of 'Bauermeister' and has signed below.

*Julius B. St. John*  
\_\_\_\_\_  
*Deputy* Administrator, USDA Agricultural Research Service  
Washington, D.C. 20250

*8/10/05*  
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Date

**Supplement to Variance Statement for Bauermeister Hard Red Winter Wheat**

Bauermeister Registered and Certified class seed has been found to contain a higher number of white wheat variant than allowed by the present variety description. We would like to there for amend the current variety description stating Bauermeister may contain up to 20 white seeds per pound to the following.

“Bauermeister may contain up to a total of up to 35 white seeds per pound as a common naturally occurring variant.”