Registration of ‘Genou’ Wheat

‘Genou’ (Reg. no. CV-986, PI 640424) hard red winter wheat (Triticum aestivum L.) was developed by the Montana Agricultural Experiment Station and released in August 2004. Genou was released for its host plant resistance to the wheat stem sawfly (Cephus cinctus Nort.) conditioned by stem solidness along with improved yield potential and cold tolerance relative to other solid-stem winter wheat cultivars adapted to Montana. Genou (French for ‘knee’) was named for the “Knees” region of Montana, a key winter wheat production region of north central Montana where resistance to wheat stem sawfly is an important cultivar attribute.

Genou was selected from the cross MTS92015//Vanguard//‘Norstar’ made in 1993. Both MTS92015 and Vanguard (Carlson et al., 1997) are sib selections of ‘Rampart’ (Bruckner et al., 1997), a solid-stem cultivar that is currently the leading winter wheat cultivar in Montana. Norstar (Grant 1980) is a winter hardy cultivar released by Agriculture Canada in 1977. The F₃ bulk was vernalized under controlled conditions and transplanted to the field in Bozeman in 1993. The F₄ through F₇ generations were grown as bulks in Fort Ellis, Bozeman, Dutton, and Bozeman, MT, respectively, from 1994 to 1997 using modified bulk procedures, with selection primarily for stem solidness. Single heads were harvested from the F₃ bulk. Genou traces to a solid-stemmed line, 93X321E45, selected and bulked in 1998 as an F₃–derived F₅ headrow. The line subsequently was selected from nonreplicated observation trials grown at Bozeman, Loma, and Molt, MT in 1999 based on stem solidness, acceptable maturity and height, and satisfactory grain protein content and SDS sedimentation volume. Genou was assigned experimental number MTS0031 and subsequently evaluated in Montana Sawfly (2000–2004), Advanced (2001), Intrasrate (2002–2004), and Off-station (2002–2004) yield trials. Quality has been evaluated in multilocation Montana trials since 2000.

Seed purification of Genou was initiated in 2002 when seed derived from a single F₃,₉, seed increase plot was grown in a 4-row strip approximately 80 m long. The increased was rogued carefully to remove any phenotypic variants. Breeder seed (F₇,₉) was produced in 2003 at the Post Farm in Bozeman.

Genou is an awned, white-chaffed, medium maturity, solid-stem hard red winter wheat. Genou has medium maturity, 162 d (n = 36) to heading from 1 January, similar to Rampart (PI 593889) and approximately 2 d earlier than ‘Neeley’ (Citr 17860) and ‘Morgan’ (PI 599336). Genou is relatively tall (81 cm, n = 60), similar to Neeley (81 cm), Morgan (81 cm), and Rampart (79 cm). Coleoptile length of Genou (97 mm, n = 3) is relatively long, shorter than that of Neeley (106 mm), but longer than that of Neeley (64 mm). Genou is relatively tall (81 cm, n = 60), similar to Neeley (81 cm), Morgan (81 cm), and Rampart (79 cm). Coleoptile length of Genou (97 mm, n = 3) is relatively long, shorter than that of Neeley (106 mm), but longer than that of Neeley (64 mm). Winter survival in 12 trials showing differential survival was 52% for Genou compared to Morgan (62%, LSD₀.₀₅ = 6%), Neeley (53%), and Rampart (43%).

Stem solidness was evaluated on the scale of 5 = hollow to 25 = solid described by Cook et al. (2004). Stem solidness of Genou (19.6, n = 22) was lower than stem solidness of Rampart (21.5, LSD₀.₀₅ = 1.0) but higher than hollow-stemmed checks Morgan (7.0) and Neeley (6.5). In six environments with differential cutting by wheat stem sawfly, average stem cutting in Genou was equivalent to the solid stem check (Rampart or Vanguard) in 6 of 6 environments, less than Neeley in 4 of 6 environments, and less than Morgan in 6 of 6 environments.

On the basis of limited field observations, Genou is moderately susceptible to stem rust (caused by Puccinia graminis Pers.:Pers. f. sp. tritici Eriks. & E. Henn.), and susceptible to leaf rust (caused by Puccinia striiformis Eriks.), and stripe rust (caused by Puccinia striiformis f. sp. tritici Westend.). Genou is susceptible to Russian wheat aphid (Diuraphis noxia Mordvilko).

Genou was tested at 60 trial locations of the Montana Intrasrate, Advanced, Sawfly, and Off-station winter wheat nurseries from 2000 to 2004. Grain yield of Genou (3661 kg ha⁻¹) was lower (P < 0.05) than Neeley (3903 kg ha⁻¹), similar to Morgan (3654 kg ha⁻¹), and higher than Rampart (3387 kg ha⁻¹). Grain volume weight of Genou (776 kg m⁻³) was similar to Rampart (774 kg m⁻³) and higher than that of Neeley (766 kg m⁻³) and Morgan (759 kg m⁻³). Grain protein content of Genou (142 g kg⁻¹, n = 55) was higher than Neeley (139 g kg⁻¹) and Morgan (138 g kg⁻¹), but lower than Rampart (146 g kg⁻¹).

Millling and bread baking characteristics of Genou were determined from composite grain samples harvested at multiple Montana locations over a 5-yr period (2000–2004, n = 20 location–years). Milling and baking qualities of Genou are similar to those of Rampart. Brabender Automat flour extraction of Genou (661 g kg⁻¹) was similar to that of Rampart (660 g kg⁻¹), and greater than that of Neeley (642 g kg⁻¹). Flour ash of Genou (3.7 g kg⁻¹) was similar to that of Rampart (3.7 g kg⁻¹) and Neeley (3.7 g kg⁻¹). Genou (723 g kg⁻¹) had similar bake water absorption to Neeley (718 g kg⁻¹) and Rampart (728 g kg⁻¹). Bake mixing time of Genou (8.0 min, n = 12) was long, similar to that of Rampart (7.7 min), and longer than that of Neeley (6.1 min). Pup loaf volume of Genou (1133 cc) was similar to that of Rampart (1129 cc) and greater than that of Neeley (1067 cc).

The Montana Agricultural Experiment Station will maintain Breeder seed of Genou. Genou has been submitted for U.S. Plant Variety Protection with the certification option. A research fee will be assessed on all Registered and Certified seed sales. Small quantities of seed for research purposes may be obtained from the corresponding author for at least 5 yr from the date of this publication.


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References


P.L. Bruckner, J.E. Berg, and D.L. Nash, Dep. of Plant Sciences & Plant Pathology, Montana State Univ., Bozeman, MT 59717-3140; G.D. Kushnak, Western Triangle Agricultural Research Center, P.O. Box 974, Conrad, MT 59425; R.N. Stougaa, Northwestern Agricultural Research Center, 4570 Montana 35, Kalispell, MT 59901; J.L. Eckhoff, Eastern Agricultural Research Center, 1501 N. Central, Sidney, MT 59270; G.R. Carlson, Northern Agricultural Research Center, 3848

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