Registration of ‘Hatcher’ Wheat

‘Hatcher’ (Reg. no. CV-971, PI 638512) hard red winter wheat (Triticum aestivum L.) was developed by the Colorado Agricultural Experiment Station and released to seed producers in August 2004. Hatcher was released based on its resistance to the original North American biotype, designated as Biotype 1 (D.R. Porter, personal communication, 2004) of the Russian wheat aphid [Diuraphis noxia (Mordvilko)], and its adaptation to nonirrigated production in eastern Colorado and the west-central Great Plains. ‘Hatcher’ was named in honor of the late E.L. “Shug” Hatcher, a former Colorado Wheat Industry leader who farmed near Lamar, CO.

Hatcher was selected from a population derived from a series of crosses and backcrosses completed in 1993: ‘Yuma’/PI 372129//’TAM-200’/3/4’Yuma’/4/KS91H184/’Vista’, PI 372129 is a Russian wheat aphid–resistant landrace from Turkmenistan that carries the Dn4 Russian wheat aphid resistance gene (Quick et al., 1991); Yuma (PI 559720) is a hard red winter wheat cultivar released by Texas A&M University in 1986 (Worrall et al., 1995); Vista (PI 562653) is a hard red winter wheat cultivar...
Hatcher was tested at eight locations of the Colorado Irrigated Variety Performance Trial (IVPT) during 2002, 2003, and 2004. In these trials, Hatcher (6598 kg ha\(^{-1}\)) had a lower mean yield than Prairie Red (7015 kg ha\(^{-1}\)) but a higher mean yield than Ankor (6510 kg ha\(^{-1}\)). Average grain volume weight of Hatcher (745 g L\(^{-1}\)) was higher than that of both Prairie Red and Ankor (723 g L\(^{-1}\)). The straw strength of Hatcher in these irrigated trials was moderate (4.6 score, 1 = erect to 9 = flat scale, \(n = 9\) observations), and weaker than those of Ankor (3.9 score) and Prairie Red (2.3 score). Hatcher was tested in the 2003 and 2004 Southern Regional Performance Nursery (SRPN). Across locations in the High Plains region, Hatcher was the second highest entry in the trial in both 2003 (seven location mean yield 4697 kg ha\(^{-1}\); 46 total entries) and 2004 (nine location mean yield 3533 kg ha\(^{-1}\); 50 total entries).

Milling and bread baking characteristics of Hatcher were determined from multilocation composite grain samples in 2000, 2001, and 2002 and three single-location evaluations in 2001 (\(n = 6\) observations). Ankor and ‘Prowers 99’ (PI 612420) were used as checks in these evaluations. Values for milling-related variables were generally superior to both Ankor and Prowers 99. Hatcher had higher grain volume weight (761.9 kg m\(^{-3}\)) than Ankor (732.3 kg m\(^{-3}\)) and Prowers 99 (749.0 kg m\(^{-3}\)). On the basis of Single Kernel Characterization System (SKCS) analysis, Hatcher had higher kernel weight (28.5 mg kernel\(^{-1}\)) than Ankor (25.2 mg kernel\(^{-1}\)) and Prowers 99 (26.3 mg kernel\(^{-1}\)); higher SKCS kernel diameter (2.17 mm) than Ankor (2.03 mm) and Prowers 99 (2.11 mm); and lower SKCS kernel hardness index (71.8 score) than Ankor (73.3 score) and Prowers 99 (80.0 score). Hatcher had higher Quad-romat Senior flour extraction (685 g kg\(^{-1}\)) than Ankor (658 g kg\(^{-1}\)) and Prowers 99 (679 g kg\(^{-1}\)) and lower flour ash (4.1 g kg\(^{-1}\)) than Ankor (4.4 g kg\(^{-1}\)) and Prowers 99 (4.8 g kg\(^{-1}\)). Values for baking-related variables of Hatcher were generally intermediate between Ankor and Prowers 99. Hatcher (120 g kg\(^{-1}\)) had similar grain protein content as Ankor (120 g kg\(^{-1}\)) and lower than Prowers 99 (138 g kg\(^{-1}\)). In mixograph tests optimized for water absorption, Hatcher had higher water absorption (618 g kg\(^{-1}\)) than Ankor (615 g kg\(^{-1}\)) and lower than Prowers 99 (649 g kg\(^{-1}\)); higher tolerance score (3.2 score; 0 = unacceptable to 6 = excellent scale) than Ankor (2.2 score) and lower than Prowers 99 (4.0 score); and longer mixing time (3.2 min) than Ankor (2.9 min) and shorter than Prowers 99 (4.0 min). In straight-grade pup loaf baking tests, Hatcher had lower bake water absorption (600 g kg\(^{-1}\)) than Ankor (604 g kg\(^{-1}\)) and Prowers 99 (633 g kg\(^{-1}\)); longer bake mixing time (4.2 min) than Ankor (3.6 min) and shorter than Prowers 99 (5.1 min); smaller pup loaf volume (0.872 L) than Ankor (0.888 L) and Prowers 99 (0.945 L); and lower loaf crumb grain score (3.8 score; 0 = unacceptable to 6 = excellent scale) than Ankor (4.0 score) and Prowers 99 (4.5 score).

The Colorado Agricultural Experiment Station will maintain Breeder seed of Hatcher. Multiplication and distribution rights of other classes of Certified seed have been transferred from the Colorado Agricultural Experiment Station to the Colorado Wheat Research Foundation, 7100 S. Clinton St. Suite 120, Centennial, CO 80112. Hatcher has been submitted for U.S. Plant Variety Protection under Public Law 91-577 with the certification only option. Small quantities of seed for...
In diverse regions of Honduras in 2001 and 2002, Carrizalito CSSA. Accepted 30 April 2005. *Corresponding author (scott.haley@Quality Laboratory, 1515 College Avenue, Manhattan, KS 66502; to 1347 kg ha−1 compared to 885 kg ha−1 for the local check. Carrizalito was an F2 generation plant line from the cross 'Tio Canela 75'×DICTA 105. The F2 was grown in a greenhouse. Individual F2 plants were selected in the field at Zamorano for upright architecture and early maturity (<70 d). The F3 to F6 families were evaluated during 1996 to 1998 for agronomic traits as well as for resistance to natural incidence of Bean common mosaic virus (BCMV), anthracnose [caused by Colletotrichum lindenuthianum (Sacc. & Magnus) Lams.-Scrib.], angular leaf spot [caused by Phaeoisariopsis griseola (Sacc.) Ferraris], and web blight [caused by Thanatephorus cucumeris (Frank) Donk]. Artificial inoculations with local isolates of the common bacterial blight (CBB) pathogen Xanthomonas campestris pv. phaseoli (Smith) Dye and with rust [caused by Uromyces appendiculatus (Pers.:Pers.) Unger] at the University of Puerto Rico from October to December 1997. Plants within BGYMV resistant families were harvested in bulk. Selection for commercial small red seed type was practiced in every generation. In 2004, Carrizalito was mechanically inoculated at the University of Puerto Rico (UPR) with the NL3 strain of Bean common mosaic necrotic virus (BCMV) and found to have top necrosis caused by the presence of the dominant I gene for resistance to BCMV. Ashy stem blight is favored by warm dry conditions associated with drought stress (Mayek-Pérez et al., 2002). Seedlings of Carrizalito were inoculated in the greenhouse at the UPR with the ashy stem blight pathogen Macrophomina phaseolina (Tassi) Goid. and found to be resistant (M. Alameda-Lozada, personal communication, 2004).

In 1999, the average yield of Carrizalito across 17 locations in the Central American and Caribbean Regional Yield Adaptation Trial (ECAR) was 2259 kg ha−1 compared to 1803 kg ha−1 for the local check and 1741 kg ha−1 for the elite check 'Dorado'. In 2000, the average yield of Carrizalito across 13 locations in the ECAR trial was 2039 kg ha−1 compared to 1347 kg ha−1 for the local and 1730 kg ha−1 for elite checks. In 2001, the average seed yield across six locations in the ECAR trial was 1981 kg ha−1 for Carrizalito, 1417 kg ha−1 for the local, and 2025 kg ha−1 for the elite checks (Rosas and Escoto, 2003). In diverse regions of Honduras in 2001 and 2002, Carrizalito produced an average yield of 2576 kg ha−1, whereas the elite cultivar Dorado averaged 1980 kg ha−1 and the local check produced 2339 kg ha−1. In on-farm trials in 2002 across 43 locations in 11 municipalities in Honduras, the average yield of Carrizalito was 1660 kg ha−1 compared to 960 kg ha−1 for the local check. Also, Carrizalito was superior to the bean landraces for resistance to anthracnose, angular leaf spot, BGYMV, CBB and rust. In 40 yield trials in Costa Rica, conducted from 1999 to 2002 in diverse bean production areas, from 9 m asl at Cañas to 960 m asl at Puriscal, Carrizalito produced an average yield of 1098 kg ha−1 compared to 885 kg ha−1 for 'Bribri' (Rosas et al., 2003) and 1007 kg ha−1 for the local check. Carrizalito was superior to Bribri and the local check in 85 and 70% of these trials, respectively. The experimental mean seed yield of Carrizalito was 1090 kg ha−1 with a maximum yield of 2722 kg ha−1. Under conventional production practices in on-farm trials, Carrizalito produced an average yield of 1062 kg ha−1 with a maximum yield of 1840 kg ha−1 (Hernandez and Araya, 2004). Carrizalito has an indeterminate upright, Type III growth habit with a short vine. Carrizalito flowers in 35 to 37 d and matures in 68 to 70 d. Stem color is green with red pigmentation. Green pods turn yellow with red pigmentation at physio-