Registration of ‘AR 910’ Wheat

‘AR 910’ soft red winter wheat (Triticum aestivum L.) (Reg. no. CV-981, PI 636470) was developed by the Arkansas Agricultural Experiment Station. It was released in September 2004 due to its resistance to stripe rust (caused by Puccinia striiformis Westend.) and consistently high grain yield under mid-South conditions.

AR 910 was derived from the cross of AR369–4-2/‘Bayles’ which was made in 1992. AR369–4-2 was a very early-maturing breeding line with the pedigree ‘Rosen’/FL 737. Rosen (Bacon et al., 1986) was a broadly adapted cultivar from the University of Georgia with the pedigree T76–6562A1–4-2/‘Blueboy II’/‘Coker 68–8’. Bayles was a cultivar released by the University of Georgia with the pedigree T76–864/‘McNair 1003’ (Newton et al., 1980). The population was grown as a bulk in the F2 and F3 generations at Stuttgart, AR, and consistently in an F4:5 headrow based on plant height, maturity date, plant type, reaction to leaf rust (caused by P. triticina Erk.), and reaction to Septoria leaf blotch [caused by the fungus Mycosphaerella graminicola (Fuckel) Schrötter (anamorph: Septoria tritici Roberge in Desmaz.)]. One of the resulting F5:6 experimental lines was designated as AR 910–9–1. During the F6 generation the line was advanced because of its early maturity and resistance to Wheat soilborne mosaic virus. During subsequent generations, it was advanced primarily due to grain volume weight and yield under Arkansas conditions. It was tested as AR 910–9–1 in the Arkansas Small-Grain Cultivar Performance Trials in 2002, 2003, and 2004 and in the USDA-ARS Uniform Southern and Uniform Eastern Soft Red Winter Wheat regional nursery in 2002, 2003, and 2004.

In three trials in Arkansas, under natural infection by Wheat soilborne mosaic virus, AR 910 was resistant with an average rating of 1 on a 0-to-9 scale, compared with the susceptible ‘AGS 2000’ (Johnson et al., 2002), with a rating of 6. AR 910 was resistant (2.3% severity) to stripe rust in inoculated screening nurseries at Fayetteville, AR, in 2002, 2003, and 2004 as compared to ‘Coker 9663’ which was susceptible with 39.4% severity. In a naturally infected nursery in Lewisville, AR, in 2005, AR 910 had 1% severity of stripe rust whereas Coker 9663 had 93%. In Arkansas trials in 2002 under natural infection, AR 910 exhibited resistance (0.7% severity) to leaf rust compared to 45% severity on the susceptible ‘Sabbe’ (Bacon et al., 2002). In an inoculated (race TNRL) screening nursery at Kibler, AR, in 2003, AR 910 had 10% severity compared with 36% severity on the susceptible Sabbe. According to seedling tests conducted by the USDA-ARS Cereal Disease Laboratory, St. Paul, MN, AR 910 contains the gene Lr17 plus an unidentified gene(s) for leaf rust resistance. AR 910 is resistant to populations of powdery mildew (caused by Blumeria graminis DC. f. sp. tritici Ém. Marchal) found in Arkansas; having a 0% infection in a naturally infected nursery at Lewiscville, AR, in 2004 compared with 25% infection for the original breeder seed was derived from compositing seed from 145 F10:11 headrows selected for phenotypic uniformity. Breeder seed will be maintained by rouging and periodically doubling theARS Uniform Southern and Uniform Eastern Soft Red Winter Wheat Cultivar Performance Tests in 2002, 2003, and 2004, AR 910 had a slightly higher yield in 2004 across the state variety tests in Arkansas, Mississippi, and Louisiana, 5174 vs. 5060 kg ha⁻¹), a slightly higher than Pat in 23 Arkansas Small-Grain Cultivar Performance Tests in 2002, 2003, and 2004 (4852 kg ha⁻¹) yielded slightly less than Pat (4973 kg ha⁻¹) but had a slightly higher yield in 2004 across the state variety tests in Arkansas, Mississippi, and Louisiana, 5174 vs. 5060 kg ha⁻¹), respectively. AR 910 has good winterhardiness and adaptation, showing no winter kill in Arkansas from 2002 to 2004. In 15 locations reporting winter damage in the Arkansas Small-Grain Cultivar Performance Tests in 2002, 2003, and 2004 Uniform Eastern Nursery, winter survival of AR 910 (87.3%) was similar to the check ‘Caldwell’ (85.3%).

Based on data from the Arkansas Small-Grain Cultivar Performance Tests in 2002, 2003, and 2004 for both AR 910 and AGS 2000, and a cookie top grain score of 106.4 for AR 910 and 106.4 for AGS 2000, and a lactic acid retention value of 116.5 for AR 910 and 124.5 for AGS 2000, flour yield of 72.7% for AR 910, 73.3% for AGS 2000, a milled quality score of 86 for both AR 910 and AGS 2000, and a baking score of 68 for both AR 910 and AGS 2000. Individual quality parameters from these tests compared to ‘Sabbe’, which had 58.4% for AR 910, 58.4% for AGS 2000, flour yield of 72.7% for AR 910 and 73.3% for AGS 2000, flour protein content of 13.7% for AR 910 and AGS 2000, lactic acid retention value of 116.5 for AR 910 and 124.5 for AGS 2000, milled quality score of 86 for both AR 910 and AGS 2000, and a baking score of 68 for both AR 910 and AGS 2000.

Original breeder seed was derived from compositing seed from 145 F10:11 headrows selected for phenotypic uniformity. Breeder seed will be maintained by rouging and periodically doubling the seed batch. AR 910 is similar in plant height (approximately 96 cm) to AR 910 was tested for end-use quality characteristics at the USDA-ARS Soft Wheat Quality Laboratory in Wooster, OH, for providing end-use quality data. The authors thank the personnel at the USDA-ARS Soft Wheat Quality Laboratory in Wooster, OH, for providing end-use quality data and the personnel at the USDA-ARS Cereal Disease Laboratory in St. Paul, MN, for providing end-use quality data. The authors thank the personnel at the USDA-ARS Cereal Disease Laboratory in St. Paul, MN, for providing end-use quality data.

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