Registration of ‘Alliance’ Wheat

‘Alliance’ (Reg. no. CV-799, PI 573096) is a hard red winter wheat (*Triticum aestivum* L.) developed cooperatively by the Nebraska Agricultural Experiment Station and the USDA-ARS. It was jointly released to seed producers in 1993 by the developing institutions and the South Dakota Agricultural Experiment Station. The name was chosen to honor the 40th anniversary of the founding of the Nebraska Wheat Development, Utilization, and Marketing Board; the 40th anniversary of the founding of Nebraska Wheat Growers’ Association; the support of Nebraska Crop Improvement Association and the Nebraska Foundation Seed Division; and the interdisciplinary and interstate cooperative research efforts needed to develop this cultivar. Alliance was selected from the cross ‘Arkan’/‘Colt’/‘Chisholm’ sib (made in 1982 by Dr. J.W. Schmidt). Alliance is an *F₃* derived line that was selected in the *F₄*, given an experimental line number in 1988, and tested as NE88595. Alliance was released primarily because of its high yield potential and resistance to diseases and insects in its area of adaptation.

Alliance is an awned, white-glumed cultivar. The foliage is green, with a waxy bloom at anthesis. The spike is midsize and tapering. The glume is short to midlong and narrow to midwide. The glume shoulder is narrow and oblique to square. The beak is very short to short. Kernels are red colored, hard textured, and ovate. The kernel has no collar, rounded cheeks, midsize germ, large brush of medium length, and a narrow and shallow crease.

Alliance was tested in Nebraska yield nurseries starting in 1989, in the Southern Regional Performance Nursery starting in 1991, and in the Northern Regional Performance Nursery in 1993. In 4 yr of testing (18 location-years) in the Nebraska Intrastate Nursery, Alliance (3070 kg ha⁻¹) was 5, 7, 6, and 17% higher yielding than ‘Redland’, ‘Vista’, ‘Arapahoe’, and ‘TAM 107’, respectively. In 2 yr of testing (1992 and 1993) in the Nebraska Fall Sown Cereal Variety Trials (22 location-years), Alliance (3720 kg ha⁻¹) was 8% higher yielding than Arapahoe and TAM 107, and 4% higher yielding than Redland and Vista. In 2 yr of testing in the Southern Regional Performance Nursery (53 location-years), Alliance (3510 kg ha⁻¹) was 4% lower yielding than TAM 107. However, in the northern High Plains region (southwestern and western Nebraska, northwestern Kansas, and northeastern Colorado; 8 location-years), Alliance (3290 kg ha⁻¹) was 8% higher yielding than TAM 107. The recommended growing area for Alliance is western Nebraska and southwestern South Dakota.

Alliance is a semidwarf cultivar that is 4 cm taller than TAM 107 and 12 cm shorter than ‘Scout 66’, a conventional height wheat. It is similar in plant height to Arapahoe and Redland, but taller than Vista, and has moderate straw strength. The straw strength of Alliance is less than Redland, Siouxland, TAM 107, ‘Abilene’, and ‘Thunderbird’. Alliance has a short awn (less than 3 cm long) and a short glume (less than 1 cm long) compared with Arapahoe and Scout 66. Alliance is a medium-early cultivar, 1.5 d earlier than Arapahoe and TAM 107.

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Alliance has exhibited moderate resistance to leaf rust (caused by *Puccinia graminis* Pers.: Pers.) and brown spot (*Helminthosporium* Schwabe) and good resistance to stem rust (*Puccinia graminis* Pers.: Pers.) and powdery mildew (*Erysiphe graminis* Fr.). Its reaction to wheat stem rust is lower than TAM 107, which is adequate for Nebraska conditions. Alliance has a heterogeneous reaction to the Great Plains biotype of Hessian fly (*Mayetiola destructor* Roberge ex Desmaz.) and soilborne wheat mosaic virus. Its reaction to wheat streak mosaic virus needs further evaluation.

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The grain volume weight of Alliance is similar to Arapahoe, and superior to Redland, ‘Vista’, ‘Arapahoe’, and ‘TAM 107’, respectively. In 2 yr of testing (1992 and 1993) in the Nebraska Fall Sown Cereal Variety Trials (22 location-years), Alliance (3720 kg ha⁻¹) was 8% higher yielding than Arapahoe and TAM 107, and 4% higher yielding than Redland and Vista. In 2 yr of testing in the Southern Regional Performance Nursery (53 location-years), Alliance (3510 kg ha⁻¹) was 4% lower yielding than TAM 107. However, in the northern High Plains region (southwestern and western Nebraska, northwestern Kansas, and northeastern Colorado; 8 location-years), Alliance (3290 kg ha⁻¹) was 8% higher yielding than TAM 107. The recommended growing area for Alliance is western Nebraska and southwestern South Dakota.

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