Registration of ‘Sheyenne’ Soybean

T. C. Helms,* B. D. Nelson, and R. J. Goos

‘Sheyenne’ soybean \([Glycine\ max\ (L.)\ Merr.]\) (Reg. No. CV-494, PI 647867) was developed by the North Dakota Agricultural Experiment Station, North Dakota State University, and released on Jan. 28, 2007. Sheyenne has high yield, is tolerant to iron-deficiency chlorosis and resistant to lodging.

Sheyenne is an \(F_4\)-derived line, originally designated ND01-3906, with the pedigree Pioneer 9071 \(\times\) A96-492041. ‘Pioneer 9071’ was developed by Pioneer Hi-Bred Int., Inc. A96-492041 was developed by Iowa State University and never released. The pedigree of A96-492041 is ‘NK S24-92’–‘NK S19-90’. Both NK S24-92 and NK S19-90 were developed by Northrup King Co. Simple Sequence Repeat (SSR) marker data showed that Sheyenne is different from Pioneer 9071 at the following loci: Satt191, Satt373, Satt534, and Satt243. Averaged across 18 testing sites in North Dakota, during the years 2004 through 2006, Sheyenne yielded 260 kg ha\(^{-1}\) (10\%) more than Pioneer 9071 (LSD 0.05 = 12 kg ha\(^{-1}\)) and Sheyenne was four days later in maturity.

The cross leading to Sheyenne was made in the summer of 1998 at Casselton, ND. The \(F_1\) plants were grown in the 1998–1999 Chile winter nursery. The \(F_2\) population was grown in the summer of 1999 and advanced to the \(F_3\) generation by the single-pod bulk method (Fehr, 1991). The \(F_3\) population was grown in the 1999–2000 Chile winter nursery and advanced to the \(F_4\) generation by the single-pod descent method. Individual \(F_4\) plants were grown in the Fargo nursery and threshed in the fall of 2000. \(F_{4:5}\) plant-rows were evaluated in 2001 at the Fargo, ND nursery. Sheyenne was first tested as ND01-3906 in replicated yield trials in North Dakota in 2002.

Sheyenne was tested in the USDA Uniform Regional Trials: Northern States in 2005 and 2006 (Abney, 2006; Abney, 2005). In two years of USDA Uniform Regional Tests, Sheyenne yielded 343 kg ha\(^{-1}\) (10\%) more than ‘Lambert’ (LSD 0.05 = 16 kg ha\(^{-1}\)) and was one day later in maturity (Orf and Kennedy, 1994). Protein content was 389 g kg\(^{-1}\) for Sheyenne and 404 g kg\(^{-1}\) for ‘Lambert’. Oil content was 214 g kg\(^{-1}\) for Sheyenne and 217 g kg\(^{-1}\) for ‘Lambert’. Sheyenne yielded 262 kg ha\(^{-1}\) (10\%) more than ‘LaMoure’ and 444 kg ha\(^{-1}\) (18\%) more than ‘Lambert’ (Helms et al., 2005; Helms et al., 2001). Sheyenne matured 25 September, which is two days later and seven days earlier than Barnes. Lodging was rated on a 1 to 5 scale with 1 the best and 5 the worst. Sheyenne had a lodging score of 1.3 compared to LaMoure with a score of 1.2, averaged across six locations. Lodging was not observed in 2006, extreme lodging was observed at Oakes, ND and Sheyenne had a lodging score of 1.7 compared to LaMoure with a lodging score of 3.0. Plant height was 0.78 m compared to LaMoure with a plant height of 0.87 m. Iron-deficiency chlorosis was rated on a 1 to 5 scale with 1 the best and 5 the worst. When Sheyenne was evaluated for iron-deficiency chlorosis in 2004 at four high pH sites in North Dakota, it was classified as moderately resistant with scores of 3.0 for LaMoure and 3.2 for Barnes (LSD 0.05 = 0.2).

Sheyenne has purple flower color, gray pubescence, brown pod, yellow hila with dull seed coat luster, and indeterminate growth habit. It is a Maturity Group 0 cultivar (M.G. 0.8) and is generally adapted as a full-season cultivar for N. lat. Sheyenne was resistant to race 3 of \(Phytophthora\ \text{sojae}\) (M.J. Kaufmann and J.W. Gerdemann), the cause of root rot. Breeder seed of Sheyenne will be maintained by North Dakota State University. A small sample of seed for research purposes can be obtained from the corresponding author for a fee. Protection for Sheyenne under the U.S. Plant Variety Protection Act Title V is pending. Seed of Sheyenne was deposited at the National Center for Genetic Resource Preservation and will be available after the expiration of the U.S. Plant Variety Protection Act.