Registration of High-Protein Soybean Germplasm Line R95-1705

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Soybean [*Glycine max* (L.) Merr.] germplasm line R95-1705 (Reg. No. GP-358, PI 647962) was developed by the Arkansas Agricultural Experiment Station and released as a maturity group V line with high protein content and moderate yield potential.

R95-1705 originated as an F_4 plant selection from the cross of 'Hutcheson' × BARC-7. Hutcheson (PI 518664) is a widely adapted and high-yielding mid-maturity group V cultivar derived from the cross V68-1034 × 'Essex' (Buss et al., 1988). BARC-7 (PI 555397) is a high-protein maturity group IV line derived from the cross CX797-21 × D80-6931 (Leffel, 1992). The cross of Hutcheson × BARC-7 was made in the summer of 1991 at Fayetteville, AR. The plant population derived from Hutcheson × BARC-7 was advanced to the F_4 generation by a modified single-seed descent method (Fehr, 1991) from 1992 to 1994. The $F_{4:5}$ plant rows were grown and R95-1705 was selected from row 1705 of the 1995 progeny row nursery at Keiser, AR. Seeds were bulked as a pure line and the $F_{4:6}$ line was first tested in 1996 and reevaluated in subsequent years (1997–2006) in Arkansas. R95-1705 was also evaluated in the USDA Southern Regional Preliminary Group V test from 1999 to 2001 (Paris, 1999, 2000, 2001) and in the Regional Quality Traits Tests for maturity group V from 2003 to 2005 (Graef, 2003, 2004, 2005).

R95-1705 was evaluated for protein and oil contents in 22 environments from 1996 to 2006 in Arkansas. Average protein and oil contents of R95-1705 were 467 g kg^{-1} and 178 g kg^{-1}, respectively (Table 1). Protein content of R95-1705 was on average 15% greater than that of Hutcheson (408 g kg^{-1}; Buss et al., 1988), 'Ozark' (403 g kg^{-1}; Chen et al., 2004), and '5601T' (408 g kg^{-1}; Pantalone et al., 2003). Oil content of R95-1705 was 16% less than that of maturity group V check cultivars (213 g kg^{-1}) on average. R95-1705 ranked first for protein content in the USDA Southern Regional Preliminary Group V test from 1999 to 2001 (Paris, 1999, 2000, 2001) and in the Regional Quality Traits Tests for maturity group V from 2003 to 2005 (Graef, 2003, 2004, 2005). R95-1705 was evaluated for seed yield in 43 environments in Arkansas. Average seed yield of R95-1705 (3067 kg ha^{-1}) was 13, 16, and 18% less than that of Hutcheson (3524 kg ha^{-1}), Ozark (3665 kg ha^{-1}), and 5601T (3726 kg ha^{-1}), respectively (Table 1).

Table 1. Average protein and oil contents and seed yield of R95-1705 and maturity group V check cultivars.

Cultivar	Protein	Oil	Yield
	g kg^{-1}	g kg^{-1}	kg ha^{-1}
R95-1705	467 a†	178 c	3067 b
Hutcheson	408 b	222 a	3524 a
Ozark	403 b	217 ab	3665 a
5601T	408 b	200 b	3726 a

†Means within a column followed by the same letter are not significantly different at the 0.05 probability level.

Relative maturity of R95-1705 is 5.5 (3 to 4 d later than Ozark and 1 to 2 d earlier than 5601T). Mature plant height of R95-1705 is approximately 70 cm, which is 10 to 15 cm shorter than Hutcheson and 5601T. R95-1705 has good resistance to lodging (score of 1.3) and shattering (score of 1.2). It has white flowers, gray pubescence, and a determinate growth habit. Seeds of R95-1705 have yellow cotyledons with dull yellow seed coats and buff hila. Seed size of R95–1705 (14.7 g 100 seeds^{-1}) is similar to Hutcheson (14.0 g 100 seeds^{-1}), Ozark (14.7 g 100 seeds^{-1}), and 5601T (14.1 g 100 seeds^{-1}). R95-1705 is resistant to southern stem canker [caused by *Diaporthe phaseolorum* (Cooke & Ellis) Sacc. f. sp. *meridionalis* Morgan-Jones] and susceptible to soybean cyst nematode (*Heterodera glycines* Ichinohe) (Paris, 1999, 2000, 2001).

U.S. Plant Variety Protection will not be filed for R95-1705 soybean germplasm line. Seed of R95-1705 is available from the Soybean Breeding and Genetics Program at the University of Arkansas, 115 Plant Science Building, Fayetteville, AR 72701. Small quantities of R95-1705 seed will be available for research purposes and cultivar development by request from the corresponding author. It is requested that appropriate recognition be made if this germplasm line contributes to the development of a new germplasm line or cultivar. Seed of R95-1705 will also be deposited in the USDA Soybean Germplasm Collection.

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