Registration of Fasciated Soybean Germplasm Line BARC-10

Soybean [Glycine max (L.) Merr.] germplasm line BARC-10 (Reg. no. GP-157, PI 572270) was developed by the USDA-ARS at Beltsville, MD, and released in 1993 for subsequent cycles of improvement of fasciated soybean and for studies on expressivity and penetrance of the $ff$ genes.

BARC-10, evaluated as MD87L-3882(2), was developed from the cross ‘Hobbit’ (1)/L78-2206 made by ARS at Urbana, IL in 1981. L78-2206 was developed from the cross L67L-113 [C1128 (‘Wabash’ (3)/‘Hawkeye’ (3))/2/L58-2080 (Hawkeye/‘Lincoln’ (3))]/3/PI 243541. The original source of the recessive gene $f$ conditioning fasciation, PI 243541, exhibits a broadened and flattened stem with most of the pods at the stem tip.

BARC-10 is an $F_2$ line of late Group IV maturity, the highest-yielding of all reselections from 3000 $F_4$ lines from six crosses of Hobbit $\times$ first cycle improved fasciated parental lines (2). The mean seed yields of BARC-10 and ‘Ripley’ in eight environments at Landisville, PA and Beltsville and Queenstown, MD, 1988-1992, were 3131 and 3353 kg ha$^{-1}$, respectively [LSD (0.05) = 214 kg ha$^{-1}$]. In these same environments, BARC-10 was 5 d later in maturity and 7.5 cm taller than Ripley. Lodging and seed quality scores were 2.0 and 1.5 for BARC-10 and 1.4 and 1.3 for Ripley. Seed weights of BARC-10 and Ripley were 144 and 136 mg seed$^{-1}$, respectively. Seed protein and oil of BARC-10 were similar to those of commercial cultivars in Middle Atlantic Tests (P.B. Cregan, personal communications, 1990, 1991).

The penetrance and expressivity of the $ff$ 10 are greatly reduced: most of the plants exhibited broadened stem tips with most of the pods at the main stem, with pod development distributed irregularly along the stem. Possibly selection for higher yield was in favor of modifying genes that decrease the expressivity of the $ff$ genes. $F_2$ populations from such attenuated fasciated genotypes and determinate lines Hobbit, Ripley, ‘Essex’, and ‘Dorman’ have complete range of fasciated phenotypes (R.C. Leffel, unpublished data).

Seeds of BARC-10 (100 seeds) may be obtained from the USDA-ARS Soybean and Alfalfa Res. Lab. by request for at least five years.

References and Notes

4. USDA-ARS, Soybean and Alfalfa Res. Lab., Beltsville, MD, BS10 [BS10(FR)Cn] was developed from a population BS11 after five cycles of reciprocal full-sib recurrent selection [BS11(FR)C5-2]. The classification of the parental line is AES700.

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