REGISTRATION OF L84-5873 AND L84-5932 SOYBEAN
GERMPLASM LINES RESISTANT TO BROWN STEM ROT

Soybean [Glycine max (L.) Merr.] lines L84-5873 (Reg. no. GP-135, PI 557535) and L84-5932 (Reg. no. GP-136, PI 557536) were jointly released in March 1991 by the Illinois Agricultural Experiment Station and the USDA-ARS as parent stock for soybean breeding and genetics programs because they have new sources of resistance to brown stem rot (BSR) [caused by Phialophora gregata (Allington & Chamberlain) W. Gams] different from PI 84946-2. All commercial cultivars in the USA with a high level of BSR resistance have received their resistance from PI 84946-2. The BSR germplasm releases LN80-7579 (8) and LN80-9709 (9) also have resistance derived from PI 84946-2 (5). The recent BSR resistant germplasm releases LN86-1595 and LN86-1947 (7) received their resistance from PI 437833 (KbsZ).

Both L84-5873 and L84-5932 were selected at the Illinois Agricultural Experiment Station and the USDA-ARS. L84-5873 is an F\textsubscript{5} plant progeny from ‘Williams 82’ (2) × L78-4192. L78-4192 is a BSR resistant selection from PI 86150 × (‘Williams’ (3) × ‘Union’) (1). PI 86150 was classified as BSR resistant (11). Plants in the F\textsubscript{3} through F\textsubscript{7} were grown in naturally infested fields at Urbana. Selection was based on stem splitting and selecting plants that lacked brown pith and xylem. In 1977, individual healthy F\textsubscript{7} plants were harvested and grown in progeny rows in 1978. L78-4192 was selected and yield tested in 1979. It was crossed with Williams 82 and second-cycle selection began with a bulk F\textsubscript{4} in 1982. The F\textsubscript{4} through F\textsubscript{6} generations were grown in plant progeny rows in an infested field ~2 km distance from the fields used in the first cycle. In this field, necrosis of the leaf was a common BSR symptom, and this greatly facilitated selection and reduced the need for stem splitting. Resistant F\textsubscript{6} lines were selected in 1984 and tested for agronomic performance in 1985 to 1988. Line L84-5873 was chosen for its high level of resistance to BSR and for agronomic performance greatly improved over PI 86150. PI 86150 was introduced in 1930 by the Dorsett and Morse plant exploration expedition from the Iwati Experiment Station, Morioka, Japan, under the cultivar name Iwafune Takiya (4).

L84-5932 is an F\textsubscript{5} plant progeny from the cross Williams 82 × L78-4054. L78-4054 is a BSR resistant selection from the cross Williams × PI 90138. PI 90138 was classified as BSR resistant (11). PI 90138 was probably introduced by the Dorsett and Morse 1930 expedition, but the number was apparently miscopied prior to 1949 and therefore the origin is unknown.

Selection of L78-4054 with BSR resistance from PI 90138 was conducted in the same manner as for PI 86150 in adjacent plots in the same fields each year. After crossing it to Williams 82, the second-cycle selection began with the F\textsubscript{4} in 1982, then the selection of L84-5932 in the 1984 progeny rows, and concluded with the 1985 to 1988 tests of agronomic performance.

Both L84-5873 and L84-5932 were tested in the greenhouse using the root-dip technique (10) and were found to be highly resistant to BSR stem and leaf symptoms. Both lines are of Group II maturity with indeterminate stems, white flowers, tawny pubescence, and dull yellow seed with black hila. L84-5873 has tan pods and L84-5932 has brown pods. Both are resistant to Phytophthora rot (Phytophthora megasperma (Drechs.) f. sp. glycinea) and to downy mildew [Peronospora manshurica (Naum.) Syd. ex Gäum.], to powdery mildew [Microsphaera diffusa Cke. & Pk.] (gene Rmd), and to blackleg [Xanthomonas campestris pv. glycines] (gene rrp).

L84-5873 matures 6 d later than ‘Century 84’ (13) and 4 d earlier than ‘Sherman’ (6). In comparison with Century 84, L84-5873 averages 10% lower seed yield and is similar in lodging and seed quality scores. In comparison with ‘BSR 201’ (12), L84-5873 has 10% lower seed yield and is similar in lodging and seed quality scores.

L84-5932 matures 4 d earlier than Century 84, L84-5932 averages 5% lower seed yield, has more lodging and poorer seed quality. In comparison with BSR 201, L84-5932 averages 5% lower seed yield, has a high lodging score, and is similar in seed quality.

Seed of L84-5873 and L84-5932 may be obtained from the authors.

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References and Notes