Registration of Southern Root-Knot Nematode Resistant Soybean Germplasm Line G93-9009

Soybean [Glycine max (L.) Merr.] germplasm line G93-9009 (Reg. no. GP-179, PI 591825) was developed by the Georgia Agricultural Experiment Stations and released in March of 1995 because of its high level of resistance to the southern root-knot nematode [Meloidogyne incognita (Kofoid & White) Chitwood] (Mi). G93-9009 has a similar level of resistance to Mi as PI 96354, but higher seed yield. PI 96354 has the highest level of resistance to Mi that has been identified in soybean (1,2,3).

G93-9009 is an F4-derived line from the cross G83-559 × (G80-1515 2 × PI 96354). G80-1515 is a selection from ‘Pickett 71’ × ‘Bedford’ (4,5). G83-559 is a selection from D77-6103 × F77-6903. The parentage of D77-6103 is ‘Centennial’ × J74-47 (6). J74-47 is from the same cross as Bedford. F77-6903 was selected from the cross of ‘Forrest’ × (‘Cobb’ × D68-216) (7,8). D68-216 has the same parentage as Forrest.

The F2 plants from the original cross were evaluated for resistance to Mi using greenhouse screening procedures (2). Resistant plants were backcrossed to G80-1515 and the BC1F2 plants were evaluated for resistance to Mi. Resistant plants were crossed to G83-559 and F2 plants were evaluated for resistance to Mi. The F2:3 and F3:4 seed were produced from resistant plants identified in the previous generation. The F3:4 lines were evaluated for agronomic characteristics in a field near Athens, GA, in 1992 and for resistance to Mi and soybean cyst nematode (Heterodera glycines Ichinohe) (SCN) Races 3 and 14 in a greenhouse. The F4:5 seed were harvested individually from 15 plants within each of the most agronomically desirable Mi- and SCN-resistant lines. Seed from each F4:5 plant was increased in a separate row in Puerto Rico during the winter of 1993.

The F4:6 seed were harvested from selected rows and grown in yield trials near Athens and Plains, GA, during 1993. The F4:7 seed from the nine highest yielding lines were planted in yield trials in 1994 near Athens and Plains. In addition to selected Mi- and SCN-resistant lines, each yield trial contained parental and check genotypes. Across environments, G93-9009 outyielded PI 96354 by 83% and was within 1 % of the yield of ‘Bryan’ (9). In two greenhouse experiments, G93-9009 and PI 96354 each averaged 4 Mi galls plant⁻¹, compared with 16 galls plant⁻¹ for Bryan, a cultivar that possesses the highest level of Mi resistance available to soybean growers to date (10), and 164 galls plant⁻¹ for the susceptible check ‘Bossier’ (8,10).

G93-9009 is a Maturity Group VI germplasm that matures about 4 d earlier than Bryan and 4 d later than PI 96354. It is 14 cm shorter and has better lodging resistance than Bryan. G93-9009 has white flowers, gray pubescence, tan pod walls, and a determinate growth habit. The seed have a yellow coat. G93-9009 is resistant to the peanut [Meloidogyne chitwoodi] and javanese [Meloidogyne javanica] root-knot nematodes, Races 3 and 14 of SCN, and [caused by Xanthomonas campestris pv. glycines].

G93-9009 will be maintained by the Dep. of Crop and Soil Sciences, Univ. of Georgia, Athens, GA 30602-7272. Small quantities of seed for research and breeding can be obtained from the corresponding author for at least 5 yr. It is requested that appropriate recognition be made of the source of this germplasm when it contributes to the development of a cultivar.

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References and Notes


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