Registration of ‘Fowler’ Soybean

‘Fowler’ soybean [Glycine max (L.) Merr.] (Reg. no. CV-421, PI 613195) was developed by the USDA-ARS, in cooperation with the University of Tennessee Agricultural Experiment Station and the North Carolina Agricultural Research Service. It was released in 1999 to provide a cultivar of Group V maturity with high yield potential and resistance to soybean cyst nematode (SCN) (Heterodera glycines Ichinohe). Races 2, 3, 5, and 14 (6). Fowler is best adapted to production areas between 34° and 37° N lat.

Fowler is an F6 bulk of a single-plant selection made in the F5 from the cross ‘Hartwig’ × ‘Holladay’ (1, 2). The F1 plants of the cross were challenged with a mixture of SCN Races 2, 3, 5, and 14 in the greenhouse during the spring of 1992. Resistant plants were transplanted to the field for seed production. The transplants were progeny tested in each succeeding generation for resistance to the four SCN races in separate plots. A single plant was chosen from a progeny row in each of the F2, F3, and F4 generations, and the remainder of the row was bulked for yield evaluation during the next year. One hundred and twenty F5 plants were selected from the border rows of yield plots, tested for resistance to each of the four SCN races, and grown in progeny rows in the field for selection for uniformity of flower, pubescence, pod wall color, plant growth, and maturity. Selected rows were bulked in the F1 generation.

Fowler matures ≈1 d later than ‘Hutcheson’ (3). It has determinate plant type, white flower, tawny pubescence, and tan pod wall. Seeds are shiny yellow with black hilum. Fowler has been confirmed to be resistant to SCN Races 2, 3, 5, and 14 by greenhouse tests. It may have resistance to other SCN races because the resistant parent, Hartwig, is resistant to most races of the nematode. Fowler is susceptible to stem canker caused by Diaporthe phaseolorum Cook & Ellis Sacc. var. meridionalis F.A. Fernandez and root-knot nematodes [Meloidogyne arenaria (Neal) Chitwood and M. incognita (Kofoid & White) Chitwood]. Fowler, tested as J94-7, averaged 8 to 16 bushels per acre more than Hartwig in 1994 to 1995 and in 1997 in evaluated in yield trials in Obregon. Seed purification was established by N.E. Borlaug in the mid-1940s (1). The breeding method established by N.E. Borlaug in the mid-1940s (1) and 37° N lat. states: 1997. USDA-ARS, Stoneville, MS. The F2, F3, F4, and F5 generations were evaluated in Obregon, Sonora. The F2, F3, F4, and F5 were evaluated at El Batan. The F2, F3, and F4 generations of Maravilla-TCL99 were grown at Papalotla and the University UAEM campus, respectively. Two hundred individual plants were selected from the F2 in Obregon and planted as head rows in Papalotla. The agronomically desirable and homogenous F2-derived head rows were bulked and evaluated in yield trials in Obregon. Seed purification was continued in the F3 and subsequent generations by planting 200 head rows in each generation, discarding the off-types and bulking the similar rows.

In Obregon, an arid region, Maravilla-TCL99 was selected under three types of mega-environments (ME) with ME1 as a high input environment with full irrigation, ME4 an arid environment with one irrigation before planting only, and ME5 a heat stress environment during grain filling. Early generation selection in Obregon was based primarily on agronomic type and resistance to leaf rust caused by Puccinia recondita Rob. ex Desm. f. sp. triticis and stem rust caused by Puccinia graminis Pers. f. sp. tritici Eriks. & Henn). Grain yield and test weight were additional selection criteria in the advanced generations. At El Batan, Papalotla (ME4), and Toluca, a high rainfall area (ME2), selection traits in early generations were resistance to yellow rust caused by Puccinia