Registration of a Soybean Cyst Nematode Tolerant Soybean Germplasm Line G88-20092

THE SOYBEAN [Glycine max (L.) Merr.] germplasm line G88-20092 (Reg. no. GP-145, PI 561701) was developed at the Georgia Agricultural Experiment Stations, Athens, GA, and released in 1992 as a line tolerant to soybean cyst nematode (SCN) (Heterodera glycines Ichinohe). Tolerance reduces yield loss from SCN without imposing selection pressure on the nematode for the development of a new race (4). The treatment and experimental designs for assessing tolerance have previously been described (5,6). G88-20092 has SCN tolerance similar to that of PI 97100, a plant introduction with the highest reported level of tolerance (2), but has a higher seed yield than PI 97100.

G88-20092 is an F₆-derived line obtained from the cross of PI 97100 × 'Wright' (1). Fifty-four F₂-derived lines from this cross were evaluated in 1985 and 1986 for tolerance to SCN Race 3 in Athens, GA, and SCN Race 14 in Waynesboro, GA (6). In 1987 the 15 F₂,₆ lines with the highest tolerance and mean seed yields were grown on SCN Race 3 infested soil near Athens, GA. One hundred and seventy-two F₆ plants were selected from the nine most vigorous lines. Seeds of these 172 plants were increased in Puerto Rico during the winter of 1987-1988.

In 1988, the 172 F₆-derived lines were evaluated for seed yield on a SCN Race 3 infested field near Athens, GA. The 36 highest-yielding lines were selected for further evaluation. In 1989, these 36 lines and check genotypes were evaluated for seed yield and tolerance on SCN Race 3 infested soil near Athens, GA. In 1990, the 10 lines with the highest tolerance indices [(seed yield in untreated subplot/seed yield in nematicide-treated subplot) × 100] and seed yields in nematicide-treated subplots were reevaluated.

In 1989 and 1990 the yield of G88-20092 averaged 35% higher in nematicide-treated plots and 41% higher in untreated plots than PI 97100 (Table 1). The tolerance index for G88-20092 averaged 89%, compared with 85 and 74% for PI 97100 and Wright, respectively. Results from greenhouse experiments (2) with SCN Race 3 infested soil from the site of the 1990 field experiment and with SCN Race 14 (infested soil from Waynesboro, GA) indicate that G88-20092 is tolerant to these races as PI 97100 or Wright.

G88-20092 is a Maturity Group VI germplasm line that matures 1, 4, and 5 d earlier than ‘Leflore’ and ‘Wright’, respectively. It is similar to Leflore in lodging resistance. G88-20092 has yellow seed coats and buff hilum, tan pod walls, and a determinate growth habit. The seeds have yellow seed coats and buff hilum, tan pod walls, and a determinate growth habit. The seeds are susceptible to Xanthomonas campestris pv. glycines [caused by Xanthomonas campestris (Nakano) Dye].

Seed of G88-20092 will be maintained by the Department of Agronomy, University of Georgia, Athens. Inquiries for quantities of seed (100-200 seeds) for research and breeding purposes will be provided upon written request to the corresponding author. It is requested that appropriate recognition be made of the source of this germplasm when it contributes to the development of a cultivar or new germplasm.

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References and Notes


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Table 1. Seed yield with and without a nematicide, tolerance index, and nematode reproduction for G88-20092 and PI 97100.

<table>
<thead>
<tr>
<th>Genotype</th>
<th>Seed yield†</th>
<th>Tolerance index‡</th>
<th>Genotype</th>
<th>Seed yield†</th>
<th>Tolerance index‡</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Untreated</td>
<td>Treated</td>
<td></td>
<td>Untreated</td>
<td>Treated</td>
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<tr>
<td>G88-20092</td>
<td>2.42</td>
<td>2.64</td>
<td>1.98</td>
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<td>PI 97100</td>
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<td>Wright</td>
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<td>2.56</td>
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</table>

† Seed yield in plots treated or untreated with fumigant nematicide.
‡ Tolerance index = (seed yield of untreated subplot/seed yield of treated subplot) x 100.