Table 1. Fatty-acid composition of the seed oil from two germplasm lines, two parents, and two check cultivars of soybean.

<table>
<thead>
<tr>
<th>Fatty acid</th>
<th>N85-2124</th>
<th>N85-2176</th>
<th>N78-2245</th>
<th>PI 123440</th>
<th>Tracy-M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Palmitic</td>
<td>11.0 (0.3)</td>
<td>9.5 (0.2)</td>
<td>10.4</td>
<td>10.1</td>
<td>11.5</td>
</tr>
<tr>
<td>Stearic</td>
<td>4.0 (0.2)</td>
<td>3.3 (0.2)</td>
<td>4.0</td>
<td>4.0</td>
<td>3.5</td>
</tr>
<tr>
<td>Oleic</td>
<td>31.9 (1.6)</td>
<td>44.4 (3.3)</td>
<td>34.7</td>
<td>30.3</td>
<td>29.6</td>
</tr>
<tr>
<td>Linoleic</td>
<td>49.3 (1.6)</td>
<td>39.5 (2.8)</td>
<td>45.0</td>
<td>51.1</td>
<td>48.4</td>
</tr>
<tr>
<td>Linolenic</td>
<td>3.9 (0.3)</td>
<td>3.3 (0.3)</td>
<td>5.9</td>
<td>4.5</td>
<td>7.0</td>
</tr>
</tbody>
</table>

† Mean (standard error) over three environments (Clayton, NC, 1985; Isabella, PR, 1986; Clayton, NC, 1986).
‡ Oil composition determined from seed grown in one environment (Clayton, NC, 1985). Tracy-M is a high oleic acid cultivar and N77-179 is of group V maturity.

REGISTRATION OF SOYBEAN GERMPLASM LINES WITH MODIFIED FATTY ACID COMPOSITION OF SEED OIL

Two soybean [Glycine max (L.) Merr.] lines, N85-2124 (MGV) (Reg. no. GP-114, PI 531519), and N85-2176 (MGIV) (Reg. no. GP-115, PI 531520) have been released because of their modified seed-oil quality. The seed oil of these lines has lower linolenic acid (3.3–4.0%) and higher oleic acid (32–44%) concentrations than most soybean cultivars currently available in the USA. (Table 1). Both are F₅ lines from a cross between N78-2245 and PI 123440. N78-2245 is a line with high oleic acid concentration that was derived from the fifth cycle of a recurrent-selection experiment (1,2). Fatty acid composition of the two lines and their parents were evaluated with Tracy-M, a high oleic acid cultivar (E.E. Hartwig, 1981, personal communication) and N77-179, a standard type (Table 1).

Investigation of the inheritance of fatty-acid composition in the plant population derived from this cross suggests that the low linolenic acid trait is controlled by recessive alleles at two major-genes loci, one pair contributed by N78-2245 and one pair contributed by PI 123440. Inheritance of higher oleic acid appears to be more complex.

N85-2124 is of maturity group V with a determinate growth type, grey pubescence, purple flowers, and tan pods at maturity. Seed is yellow with buff hila. N85-2176 is of Maturity Group IV with an indeterminate growth type, tawny pubescence, white flowers, and tan pod wall at maturity. Seeds are yellow with brown or black hila. A sister line, N85-2131, of the above two was developed and released. It has seed-oil fatty-acid composition similar to N85-2124, but matures about 1 wk later. Seed yield of these lines has not been evaluated with improved cultivar maturity.

The germplasm lines were released by the USDA-ARS and the North Carolina Agricultural Research Service. Quantities of 50 seed of each line will be furnished on request from the Department of Crop Science, North Carolina State University, Raleigh, NC 27695-7631.

J.W. BURTON,* R.F. WILSON, C.A. BRIM

References and Notes


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REGISTRATION OF TWO SUNFLOWER GERMPLASM POPULATIONS

Two sunflower (Helianthus annuus L.) composite germplasm populations (Reg. no. GP-108 and GP-109) developed at the University of Idaho in cooperation with USDA-ARS at Fargo, ND and SIGCO Research Inc., Breckenridge, MN, are being released (Table 1). The original populations were similar to the populations at North Dakota State University, Fargo, ND and at Breckenridge, MN for maturity, plant height, and oil content of group V maturity. Ten plants were selfed in each selected S₃ family. In 1984, 1985, and 1986, respectively. Individual plants were phenotypically selected in each generation, using the same criteria as the mass selection phase of the program, and S₄ family selection was used to develop S₅, S₆, and S₇ generations. After four cycles of mass selection, pedigrees were maintained for the five cycles of a recurrent-selection experiment (1,2). Fatty acid composition of the two lines and their parents were evaluated with Tracy-M, a high oleic acid cultivar and N77-179, a standard type (Table 1).

Investigation of the inheritance of fatty-acid composition in the plant population derived from this cross suggests that the low linolenic acid trait is controlled by recessive alleles at two major-genes loci, one pair contributed by N78-2245 and one pair contributed by PI 123440. Inheritance of higher oleic acid appears to be more complex.

N85-2124 is of maturity group V with a determinate growth type, grey pubescence, purple flowers, and tan pods at maturity. Seed is yellow with buff hila. N85-2176 is of maturity group IV with an indeterminate growth type, tawny pubescence, white flowers, and tan pod wall at maturity. Seeds are yellow with brown or black hila. A sister line, N85-2131, of the above two was developed and released. It has seed-oil fatty-acid composition similar to N85-2124, but matures about 1 wk later. Seed yield of these lines has not been evaluated with improved cultivar maturity.

The germplasm lines were released by the USDA-ARS and the North Carolina Agricultural Research Service. Quantities of 50 seed of each line will be furnished on request from the Department of Crop Science, North Carolina State University, Raleigh, NC 27695-7631.

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