SSDL: A High-quality Icebox Watermelon Breeding Line Resistant to Fusarium Wilt and Anthracnose

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There is a continuing need for improved eating quality in watermelon [Citrullus lanatus (Thunb.) Matsum. & Nakai]. The consumption of commercially produced watermelons fell from 8.1 kg per capita during the 10 years from 1951 to 1960 to 5.8 kg (28.5% decrease) for the 1971 to 1980 period. The icebox varieties ‘Minilee’ and ‘Mickylee’ (Crall, 1986) were released in 1986 to help overcome the decline or, perhaps, to reverse the trend. They are a convenient size for the consumer, and they are well adapted to shipment in cartons to domestic and foreign markets. With the release of these and other high-quality, medium- to large-size varieties, the per capita consumption has increased (Allred and Lucier, 1990). In recent years, there has been a consumer preference for diploid and triploid hybrids (Maxwell, 1992; U.S. Dept. of Agriculture, 1993).

Consumer acceptance of the solid gray-green rind, characteristic of ‘Minilee’ and ‘Mickylee’, is declining (U.S. Dept. of Agriculture, 1993). Our purpose was to develop an icebox watermelon with stripes and an excellent internal quality that is suitable for use as a parent line in watermelon hybrids.

Origin

The germplasm used to develop SSDL, a small-seed ‘Dixielite’-type, included ‘Charleston Gray’, ‘Summit’, ‘Fairfax’, Texas W-5, ‘Crimson Sweet’, and ‘WR Graybelle’ (Fig. 1). Wilt resistance came from Texas W-5 and ‘Summit’, and anthracnose resistance came from ‘Fairfax’, ‘Charleston Gray’, and ‘Crimson Sweet’. High flesh quality came from Texas W-5 and ‘Crimson Sweet’, whereas small seed and fruit size came from ‘Graybelle’. The original crosses leading to SSDL were made in 1961. The pedigree leading to J13-2 is the same as that of ‘Minilee’, ‘Mickylee’, and ‘Sugarlee’ (Crall and Elmstrom, 1998). The characteristics noted should make SSDL a good parent in hybrid crosses, especially when making triploid seed. SSDL could be crossed with a small parent to produce an

Although anthracnose resistance has not been documented in SSDL, breeding lines from which SSDL was developed were resistant to race 1 anthracnose [Colletotrichum orbiculare (Berk. & Mont.)] in greenhouse inoculation tests. SSDL is also resistant to races 0 and 1 fusarium wilt [Fusarium oxysporum f. sp. niveum (E. F. Sm.)] (Maxwell, 1992). All ‘New Hampshire Midget’ had wilt when grown in the greenhouse in soil infested with 1000 to 1200 propagules of fusarium wilt (race 1), whereas 63.3% of ‘Charleston Gray’ had wilt; ‘Calhoun Gray’ and SSDL had no wilt.

At the Univ. of Florida Gulf Coast Research and Education Center, Bradenton, in 1989 and 1990, SSDL had a higher soluble solids concentration (SSC) than any of the other icebox entries (Table 1) (Maynard, 1989, 1990). In 1989, total yield was second only to the F icebox variety ‘Tiger Baby’. Mean fruit weight was 5 to 6 kg, slightly more than that of the other icebox entries in the trials. SSDL does not mature as early as ‘Minilee’ and ‘Mickylee’; it ripens in midseason and is similar to ‘Crimson Sweet’ and ‘Charleston Gray’ in that respect.

SSDL was an observational entry in the Southern Cooperative Watermelon Trials in 1983–85. In 1983, SSDL had a higher yield and a higher SSC than ‘Petite Sweet’ over 16 locations (Table 2) (C.E. Johnson, Chairman, 1983–85 Southern Cooperative Watermelon Trials, Louisiana Agricultural Experiment Station, Calhoun). In 1984 and 1985, SSDL had a higher SSC than ‘Sugar Baby’. In 1984, total yields for SSDL and ‘Sugar Baby’ were about equal; in 1985 SSDL outyielded ‘Sugar Baby’.

Summary

SSDL is a large icebox variety with an attractive striped rind pattern, good internal red pigmentation, and a higher SSC than other icebox varieties. The small seed size and low seed count render the cut fruit appealing to the consumer. Although the rind is thin, it is tough. The characteristics noted should make SSDL an excellent parent in hybrid crosses, especially when making triploid seed. SSDL could be crossed with a small parent to produce an

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icebox-sized fruit or with a large-fruited variety to produce a standard-sized fruit.

Seed availability

The Florida Agricultural Experiment Station has requested-plant variety protection for SSDL from the Plant Variety Protection Office of the U.S. Dept. of Agriculture. Inquiries regarding seed availability and the use of this line in F₁ hybrid seed production should be directed to the Florida Foundation Seed Producers, P.O. Box 309, Greenwood, FL 32443.

Table 1. Marketable yields, melon weights, and soluble solids concentration (SSC) of juice for icebox watermelon varieties at Bradenton, Fla.

<table>
<thead>
<tr>
<th>Variety</th>
<th>Yield (lbs/acre)</th>
<th>Mean fruit wt (kg)</th>
<th>SSC (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SSDL</td>
<td>18.1</td>
<td>15.2</td>
<td>5.7</td>
</tr>
<tr>
<td>Petite Sweet</td>
<td>24.8</td>
<td>26.0</td>
<td>6.3</td>
</tr>
<tr>
<td>Sugar Baby</td>
<td>22.2</td>
<td>15.6</td>
<td>5.8</td>
</tr>
</tbody>
</table>

Literature Cited


