Table 1. Summary of fresh wholt-pod yields at green-shell maturity of cowpea cultivars at four Mississippi locations.

<table>
<thead>
<tr>
<th>Cultivar</th>
<th>1981</th>
<th>1982</th>
<th>1983</th>
<th>1985</th>
<th>1987*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bunch Purple Hull</td>
<td>3890</td>
<td>3880</td>
<td>4970</td>
<td>4370</td>
<td>3410</td>
</tr>
<tr>
<td>Corona</td>
<td>3450</td>
<td>3240</td>
<td>5240</td>
<td>4390</td>
<td>3140</td>
</tr>
<tr>
<td>Mississippi Pinkeye</td>
<td>3350</td>
<td>3240</td>
<td>5240</td>
<td>3920</td>
<td>3050</td>
</tr>
<tr>
<td>Cardinal</td>
<td></td>
<td>2640</td>
<td>5080</td>
<td>2430</td>
<td></td>
</tr>
</tbody>
</table>

*One location.

Quality, as judged (1 = disliked extremely; 5 = like extremely) in 1987 by a seven-member taste panel, of fresh and frozen 'Mississippi Pinkeye', 'Bunch Purple Hull', and 'Corona' peas was also similar. No difference among cultivars for any evaluation was found (ranges: color 3.4-4.1; appearance 3.6-4.1; moistness 3.5-4.4; texture 3.6-4.4; flavor 3.3-4.1; overall acceptability 3.3-4.2). The lower values apply to frozen peas, the higher ones to fresh peas.

The benefit from 'Mississippi Pinkeye' is resistance to more diseases than other cultivars, so that higher yields are obtained when disease is present.

Availability

Seeds are available from Wax Seed Co., Amory, MS 38821.

Literature Cited


Gy 4 Cucumber Inbred and 'Raleigh' Hybrid Pickling Cucumber

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Additional index words. Cucumis sativus, vegetable breeding

Gy 4 is a multiple disease-resistant, non-necessity cucumber (Cucumis sativus L.) inbred. It has high combining ability for either one-over or multiple harvest yield producing high-yielding hybrids when crossed to monocious inbred lines. In addition, it has a high level of resistance to anthracnose (Colletotrichum orbiculare) and angular leaf spot (Peronosoma syringae pv. lachrymans) under Wisconsin and North Carolina field conditions, including the recently identified virulent strain of Colletotrichum found in central Wisconsin (personal communication, M. I. Palmer).

Gy 4 has proved its value in hybrid combination with the monocious inbred, NCSU M 21, and we have named the hybrid 'Raleigh'. 'Raleigh' pickling cucumber had 12% more yield ($/ha in six harvests) than 'Calypso', the major cultivar in North Carolina (Table 1). It also had 26% more early yield ($/ha in the first two harvests of a six-harvest trial) than 'Calypso'. Fruit quality (shape, color, and seed cell size), length: diameter (L:D) ratio, firmness, and blower resistance were similar to 'Calypso'. 'Raleigh' was similar in yield to 'Regal' but offered improved anthracnose resistance and fruit quality and a smaller L:D ratio. Under Wisconsin conditions, 'Raleigh' was competitive with standard cultivars for yield (Table 2) and had processing quality equal to 'Calypso' (data not shown).

Origin

Gy 4 originated from the cross of the multiple disease-resistant non-necessity inbred Gy 14 with the high-yielding, high fruit quality non-necessity inbred NCSU 19D4 (Fig. 1). Segregating populations were used for disease resistance in the seedling stage, and for yield, earliness, quality, non-necessity expression, blower resistance, and disease resistance in the field. Lines inbred to the F4 (NCSU) and F9 (UW) were tested for disease resistance and non-necessity expression before being selected for final increase in isolated field plantings.

Table 1. Performance of 'Raleigh' hybrid (Gy 4 x M 21) compared with a set of standard pickling cucumber cultivars for the southeastern United States.

| Cultivar | Yield ($/ha) | Earliness ($/ha) | Quality 1-9 | Anthracnose 0-9 | Firmness (kg) | L:D ratio | Balloon (%)
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Raleigh</td>
<td>4850</td>
<td>2060</td>
<td>6.0</td>
<td>3.5</td>
<td>9.5</td>
<td>3.1</td>
<td>4</td>
</tr>
<tr>
<td>Explorer</td>
<td>3710</td>
<td>1380</td>
<td>6.2</td>
<td>4.4</td>
<td>9.1</td>
<td>3.0</td>
<td>5</td>
</tr>
<tr>
<td>Carolina</td>
<td>3980</td>
<td>1500</td>
<td>6.3</td>
<td>4.8</td>
<td>9.1</td>
<td>3.0</td>
<td>5</td>
</tr>
<tr>
<td>Calypso</td>
<td>4310</td>
<td>1640</td>
<td>6.3</td>
<td>3.8</td>
<td>9.1</td>
<td>3.1</td>
<td>3</td>
</tr>
<tr>
<td>Regal</td>
<td>4960</td>
<td>1740</td>
<td>5.6</td>
<td>4.4</td>
<td>8.2</td>
<td>3.2</td>
<td>2</td>
</tr>
<tr>
<td>Lio (5%)</td>
<td>519</td>
<td>553</td>
<td>1.0</td>
<td>1.0</td>
<td>0.5</td>
<td>0.1</td>
<td>2</td>
</tr>
</tbody>
</table>

*Data are means over 3 years (1983, 1984, 1985), two seasons (spring, summer), and three replications. Yield data are summed over six harvests. Dollar values based on North Carolina processor prices for grades one through four. Earliness is the value of the fruit from harvest one and two for quality, 1 = poor, 9 = excellent; for anthracnose, 0 = no disease, 9 = plant dead. Firmness is the force required to punch a hole in 45-mm-diameter fruits (10-fruit samples) with a Magnes-Taylor tester having an 8-mm tip. L:D is the length: diameter ratio of 35-mm-diameter fruits (10-fruit samples). Balloon is the percentage of the fruit tissue damaged by balloon bloating in a brine tank purged with 100% CO2 gas.

Table 2. Performance of 'Raleigh' hybrid (Gy 4 x M 21) compared with a set of standard pickling cucumber cultivars in 1983 through 1986 in Wisconsin.

<table>
<thead>
<tr>
<th>Cultivar</th>
<th>1983</th>
<th>1984</th>
<th>1986</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Fruits/ha</td>
<td>L:D</td>
<td>Fruits/ha</td>
</tr>
<tr>
<td>Raleigh</td>
<td>6.8</td>
<td>40.9</td>
<td>2.7</td>
</tr>
<tr>
<td>Calypso</td>
<td>5.6</td>
<td>43.0</td>
<td>2.9</td>
</tr>
<tr>
<td>Regal</td>
<td>8.1</td>
<td>43.0</td>
<td>2.9</td>
</tr>
<tr>
<td>Lio (5%)</td>
<td>5.1</td>
<td>40.8</td>
<td>2.9</td>
</tr>
</tbody>
</table>

Table 3. Diseases for which Gy 4 has been evaluated in field and greenhouse tests.

<table>
<thead>
<tr>
<th>Pathogens</th>
<th>Common name</th>
<th>Test*</th>
<th>Reaction*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cladosporium cucumerinum Ell. &amp; Arth.</td>
<td>Scab (spot rot)</td>
<td>GH + F</td>
<td>R</td>
</tr>
<tr>
<td>Cucumber mosaic virus</td>
<td>CMV</td>
<td>GH + F</td>
<td>M</td>
</tr>
<tr>
<td>Pseudomonas syringae pv. lacrymans (Smith &amp; Bryan) Young et al.</td>
<td>Angular leaf spot</td>
<td>GH + F</td>
<td>R</td>
</tr>
<tr>
<td>Colletotrichum orbiculare (Berk. &amp; Mont.)</td>
<td>Antracnose</td>
<td>GH + F</td>
<td>R</td>
</tr>
<tr>
<td>var. Arx</td>
<td>downy mildew</td>
<td>GH + F</td>
<td>R</td>
</tr>
<tr>
<td>Pseudoperonospora cubensis (Berk. &amp; Curt.)</td>
<td>Powdery mildew</td>
<td>GH</td>
<td>R</td>
</tr>
<tr>
<td>Russetia sp.</td>
<td>Fusarium oxysporum</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sphaerotheca fuliginea (Schlecht.: Fr.) Poll.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fusarium oxysporum (Schlecht.)</td>
<td>Fusarium wilt</td>
<td>F</td>
<td>R</td>
</tr>
<tr>
<td>Daldiniastryxia (Auerw.) Rehm</td>
<td>Gummy stem blight</td>
<td>F</td>
<td>R</td>
</tr>
<tr>
<td>Rhizoctonia solani Kuhn</td>
<td>Belly rot</td>
<td>F</td>
<td>I</td>
</tr>
</tbody>
</table>

*Tests were on mature plants in the field (F), or on seedlings in the greenhouse (GH).

*Host reaction was resistant (R), moderately resistant (M), or intermediate (I).

Description

Vine. Gy 4 has moderate size, medium-green vines with an indeterminate, branched plant type or habit. Leaves are medium size. Vine growth is less than Gy 14 under hot, humid conditions common to the spring and summer production seasons of the southeastern United States and in the more temperate midwest: production areas.

Flowering habit. The plants are gynoeceous, nonparthenocarpic, and reach 50% flowering when plants are ~30 days old (when grown under controlled 30/30C daylight/night conditions). Flowering is sequential and usually begins at the first node.

Fruits. Gy 4 is a pickling cucumber with short, dark green fruits and white spines (Fig. 2). The fruits are coarse-spined (moderately warty), and have a slight speckling and striping (not uniform green), as is typical of American pickling cucumbers. Gy 4 has a L : D ratio of ~2.8 for 35-mm-diameter fruits.

Resistance. Gy 4 has field resistance to seven diseases common in the United States (Table 3): scab, cucumber mosaic virus, downy mildew, powdery mildew, anthracnose, angular leaf spot, and fusarium wilt. It has moderate tolerance to gummy stem blight and Rhizoctonia fruit rot. Gy 4 is susceptible to or untested for reaction to target leaf spot, bacterial wilt, zucchini yellow mosaic virus, and watermelon mosaic virus.

Seeds. Mature seeds of Gy 4 are smaller

Fig. 1. History of breeding and development of Gy 4.

Fig. 2. Typical fruits of Gy 4 pickling cucumber inbred.

then those of Gy 14 (produced in North Carolina or Wisconsin), although germination is similar in the two lines.

Availability

Small amounts of breeder seed may be obtained from R.L.L.

Gy 5 Cucumber Inbred and 'Johnston' Hybrid Pickling Cucumber

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Additional index words. Cucumis sativus, vegetable breeding

Gy 5 is a multiple disease-resistant, gynoeceous cucumber (Cucumis sativus L.).

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2Professor of Plant Pathology (deceased).
3Professor of Horticulture.

inbred. It has high combining ability for multiple harvest yield, producing high-yielding hybrids when crossed to nonmonoeous inbred lines. In addition, it has a high level of resistance to anthracnose (Colletotrichum orbiculare) under North Carolina field conditions.

Gy 5, in hybrid combination with the nonmonoeous inbred, NCSU M 21, makes the hybrid 'Johnston'. 'Johnston' has about the same yield ($/ha) as 'Regal', a popular, long-fruited cultivar in North Carolina (Table 1). Fruit quality (shape, color, and seed cell size), length : diameter ratio, firmness, blister resistance, and early yield were about the same for 'Johnston' as for 'Regal'. Anthracnose resistance for 'Johnston' is higher than in