‘O32-18-3’, A Potential Muscadine Seedless Grape

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Additional index words. fruit size, uniform ripening, cluster harvesting, flower sex

‘O32-18-3’ is a seedless muscadine hybrid from the Grape Breeding Program at the Center for Viticulture & Small Fruit Research, Florida A&M University. It produces seedless muscadine grape fruits with a 3.3 g average fruit weight and a fruit sugar content of 16.1%. The fruit tastes sweet and crunchy and has an attractive fresh red color and an elliptic shape. It has moderate vigor, and is resistant to Pierce’s disease (PD). Seedlessness, uniform ripening, cluster harvesting, and PD resistance are the major advantages of the hybrid. This hybrid has showed potential as a seedless grape to grown in Florida and other muscadine production regions.

Muscadine grapes (Vitis rotundifolia Michx) are sustainable fruit crops in Florida and the southeastern United States, because of their resistance to Pierce’s disease (PD), a lethal threat to all bunch (Euvitis) grapes, and adaptability to the hot and humid growing environment. They are grown for fresh market, wine, juice and several other products. The use of muscadine grapes as a fresh market product has been demanding improved cultivars for consumers, with qualities such as large fruit, high sugar content, better taste and especially seedless fruit. Seedless grapes are overwhelmingly preferred by consumers since they are easier to prepare and eat. Currently all table muscadine grapes on the market are seeded, due to the lack of seedless muscadine cultivars for commercial production. Unlike the abundant seedless grape resources in bunch grapes, ‘Fry Seedless’ (Farrer x Redgate, Ison Nursery, GA, 1990) is the only muscadine that produce seedless grapes, but the unstable low yields and small fruit have limited its acceptance by the grape industry. Therefore, developing seedless muscadine grapes is necessary for the dynamic muscadine grape industry, which will provide more and better products for the consumers. In responding to consumer preferences and industry requires for seedless muscadine grapes, the grape breeding program at Florida A&M University (FAMU) has been working intensively over the past 20 years with numerous efforts in seedless muscadine breeding. As a result, we recently obtained a new seedless hybrid that is described herein.

Origin

‘O32-18-3’ originated from the grape breeding program at the Center for Viticulture and Small Fruit Research, FAMU. It is a hybrid seedling of ‘A11-4-4’ and ‘Flame Seedless’, crossed in 2009. The seedling was planted out in 2010, using standard vineyard management. It was noticed in 2013 for having both larger seedless fruits and uniform ripening. Its major horticultural characteristics have been further evaluated since 2013.

Major Characteristics

‘O32-18-3’ produces parthenocarpic seedless fruits with occasional seeds (Fig. 1), fruits weigh 3.3g, which is larger than the 2.2 g fruits produced by ‘Fry Seedless’ (Fig. 2, Table 1). The fruit sugar content (SSC) is 16.1%, which is slightly higher than ‘Fry Seedless’ (Table 1). The fruits of ‘O38-18-3’ are elliptic in shape (L/D = 1.09), and have a deep red color (Fig. 2, Table 1). Fruit flesh is firm, and very lightly juicy. Neither wet scars from harvested fruits, nor fruit rot during ripening have been observed.

Its clusters are of medium density, most clusters consist of 5–14 fruits, stalk or pedule 3–5cm in length. As the fruits ripen...
Table 1. Major horticultural characteristics of ‘O32-18-3’ and ‘Orlando Seedless’.

<table>
<thead>
<tr>
<th>Flower</th>
<th>Seedless type</th>
<th>Fruit size (g)</th>
<th>SSC (%)</th>
<th>Fruit shape (L/D)</th>
<th>Fruit/cluster</th>
<th>Dry scar (%)</th>
<th>Fruit rot (%)</th>
<th>Uniform ripening</th>
<th>PD (0~5)</th>
<th>Internode (cm) length</th>
<th>Internode (cm) diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fry Seedless’ self fertile?</td>
<td>parthenocarpy</td>
<td>2.2</td>
<td>15.3</td>
<td>0.97</td>
<td>4~17</td>
<td>100</td>
<td>0</td>
<td>errant</td>
<td>yes</td>
<td>0</td>
<td>3.3</td>
</tr>
<tr>
<td>‘O32-18-3’</td>
<td>female</td>
<td>parthenocarpy</td>
<td>3.3</td>
<td>16.1</td>
<td>1.09</td>
<td>4~14</td>
<td>100</td>
<td>0</td>
<td>errant</td>
<td>yes</td>
<td>0</td>
</tr>
</tbody>
</table>

uniformly, they may be cluster harvested, instead of picking single fruit as with all other muscadine cultivars. A dry or capping calyptera (Fig. 3) has been noticed with this selection, which prevents stigma’s pollen receptivity and could reduce fruit setting and yield. Improvement of nutrition, vineyard management, and/or chemical sprays to increase fruit setting are currently being studied. The vine is moderate in vigor, shoot internode is 3.4 cm in length and 0.55 x 0.42 cm in diameter. No PD symptoms have been observed during the period from 2013–16. Light black rot symptoms on leaves, but not on fruits, was noticed in 2016.

In summary, the principal advantages of ‘O32-18-3’ are the larger seedless fruit, uniform ripening, cluster harvesting, and PD resistance. Combined with certain management systems, this hybrid could be potentially grown in Florida to produce seedless muscadine grapes.