QUALITY COMPARISON OF ‘ORLANDO SEEDLESS’ WITH ‘THOMPSON SEEDLESS’ GRAPES

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Abstract. ‘Orlando Seedless’ is the first bunch grape cultivar released from the University of Florida to be considered for planting in large acreage by growers for the fresh fruit market. Comparison of sensory qualities of ‘Orlando Seedless’ with ‘Thompson Seedless’ indicates good potential for market acceptability. Color and flavor of ‘Orlando Seedless’ were rated equal to ‘Thompson Seedless,’ but cluster appearance and berry texture of ‘Thompson Seedless’ were rated higher than those of ‘Orlando Seedless.’ Average descriptive ratings of color, cluster appearance and flavor of ‘Orlando Seedless’ were between “Like Slightly” and “Like Moderately” on a 9-point hedonic scale. Texture ratings were between “Neither Like Nor Dislike” and “Like Slightly.” ‘Orlando Seedless’ grapes had lower soluble solids and lower titratable acidity and higher soluble solids:acidity ratio than ‘Thompson Seedless.’

‘Orlando Seedless’ is a seedless bunch grape cultivar that has recently been released from the breeding program at AREC-Leesburg for use in Florida (2). Initial observations have indicated that ‘Orlando Seedless’ fruit has good taste quality and could have good fresh market acceptability. As a result, commercial interest in ‘Orlando Seedless’ as fresh fruit has increased tremendously. A recent survey of 33 counties indicates that bunch grape acreage in Florida could increase by 400% to 2,500 acres in the next 5 years (1). Much of this acreage is expected to be planted in ‘Orlando Seedless’ (1).

Since commercial endeavors to produce ‘Orlando Seedless’ are predicted, a study was designed to compare the overall sensory quality of ‘Orlando Seedless’ grapes with ‘Thompson Seedless’ grapes, the standard white seedless grape.

Materials and Methods

‘Orlando Seedless’ grapes were obtained from 1-year old T-budded vines at AREC-Leesburg in July, 1986. The vines had been treated with gibberellic acid (GA3) at bloom and again 7 days later to increase berry and cluster size. Fruit was stored at 1-2°C for 2-3 days before sensory evaluation. The ‘Thompson Seedless’ grapes were obtained from a local produce distributor in Gainesville.

The sensory panel consisted of 30 faculty, staff and students from the Food Science and Human Nutrition Department. Panelists were first presented with some loose, representative berries of each cultivar on white plates, and asked to give their preference for flavor and texture using a 9-point hedonic scale. Panelists were then presented with 3 representative clusters of each cultivar on white plates and asked to give their preference for cluster appearance and color. Panelists were also asked which cultivar they preferred for each attribute. Each panelist rated his/her preference of the coded samples in private booths. Both written and oral instructions were given prior to the evaluation, and none of the panelists were familiar with ‘Orlando Seedless.’ Data were subjected to analysis of variance using panelists as blocks or replications. Means are separated by least significant difference (LSD) at 5%.

Soluble solids, pH and titratable acidity of the grapes were determined in duplicate by standard methods (refractometer, glass electrode, titrating to pH 8.2, respectively). Sample preparation involved crushing or mashing the grapes in a plastic bag and then pressing through cheesecloth. Raw product quality data were also subjected to analysis of variance, with LSD at 5% used to separate means.

Results and Discussion

There were no significant differences in color preference ratings between the 2 cultivars (Table 1). However, a higher percentage of panelists preferred the color of ‘Orlando Seedless’ to ‘Thompson Seedless.’ The green color of ‘Orlando Seedless’ was often preferred to the yellow color of ‘Thompson Seedless’ according to comments from panelists. The color of both cultivars was rated between ‘Like Slightly’ and ‘Like Moderately.’

The cluster appearance of ‘Thompson Seedless’ had a higher preference rating than ‘Orlando Seedless’ and more people preferred the cluster appearance of ‘Thompson Seedless’ (Table 1). The smaller berries and elongated clusters of ‘Orlando Seedless’ were not as acceptable as a table grape, but were still rated between ‘Like Slightly’ and ‘Like Moderately.’ Management Practices such as tipping the blooms, girdling, chemical thinning and berry size enhancement with GA3 are often required to produce the highest quality seedless table grapes, including ‘Thompson Seedless.’ Studies on ‘Orlando Seedless’ indicate that berry size can be increased by applying GA3, and research on practices required to improve cluster appearance is planned for 1987.

Table 1. Sensory quality of ‘Orlando Seedless’ and ‘Thompson Seedless’ grapes (9-point hedonic scale).

<table>
<thead>
<tr>
<th>Cultivar</th>
<th>Color</th>
<th>Cluster appearance</th>
<th>Flavor</th>
<th>Texture</th>
</tr>
</thead>
<tbody>
<tr>
<td>Orlando Seedless</td>
<td>6.8</td>
<td>6.3</td>
<td>6.4</td>
<td>5.3</td>
</tr>
<tr>
<td>Thompson Seedless</td>
<td>6.8</td>
<td>7.2</td>
<td>6.9</td>
<td>7.4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>F-test</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>ns</td>
<td>*</td>
<td>ns</td>
<td>*</td>
<td></td>
</tr>
</tbody>
</table>

*A higher value indicates greater preference.

ns, not significant, *, significant at 5% level.
Table 2. Raw product quality of ‘Orlando Seedless’ and ‘Thompson Seedless’ grapes.

<table>
<thead>
<tr>
<th>Cultivar</th>
<th>Soluble solids (%)</th>
<th>pH</th>
<th>Titratable acidity (as % tartaric)</th>
<th>Soluble solids: acidity ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Orlando Seedless</td>
<td>16.8</td>
<td>3.30</td>
<td>0.60</td>
<td>28.0</td>
</tr>
<tr>
<td>Thompson Seedless</td>
<td>19.0</td>
<td>3.35</td>
<td>0.85</td>
<td>22.3</td>
</tr>
<tr>
<td>F-test</td>
<td>*</td>
<td>*</td>
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<td>*</td>
</tr>
</tbody>
</table>

*, significant at 5% level.

There were no significant differences in flavor between ‘Orlando Seedless’ and ‘Thompson Seedless’, although the flavor of ‘Thompson Seedless’ was rated a little higher (Table 1) and more people preferred the flavor of ‘Thompson Seedless’ to ‘Orlando Seedless’. The flavor of both cultivars was rated between “Like Slightly” and “Like Moderately.” Comments from some of the panelists indicated that ‘Orlando Seedless’ had a slightly undesirable bitter and astrigent flavor imparted by the skin. ‘Orlando Seedless’ did seem to taste a little sweeter to many of panelists than ‘Thompson Seedless.’ This was due to a higher soluble solids: acidity ratio in ‘Orlando Seedless’ (Table 2). ‘Orlando Seedless’ actually had lower soluble solids than ‘Thompson Seedless’, but it also had much lower acidity.

The texture of ‘Thompson Seedless’ was definitely preferred to that of ‘Orlando Seedless’ (Table 1). Over 80% of the panelists preferred the texture of ‘Thompson Seedless’ to ‘Orlando Seedless.’ The texture of ‘Orlando Seedless’ was rated between “Neither Like Nor Dislike” and “Like Slightly.” Many panelists objected to the thicker and tougher skin of ‘Orlando Seedless’, preferring the “crunchier” texture of ‘Thompson Seedless.’ This texture type is a characteristic associated with slip-skin cultivars such as ‘Orlando Seedless.’ The texture is often influenced by berry turgidity. Improved irrigation practices, rapid cooling of grapes after harvest, and shrink wrapping to prevent moisture loss may lead to improved berry texture of ‘Orlando Seedless.’ None of the panelists seemed to notice any objectionable seed remnants.

Overall, this study suggests the color and flavor of ‘Orlando Seedless’ are of comparable quality to the standard white seedless grape, ‘Thompson Seedless.’ Management practices which would improve the cluster appearance and texture of ‘Orlando Seedless’ need to be researched. Specifically, rounder, looser clusters and “crunchier” berry texture would be desirable. Text marketing research to determine acceptability by consumers on a large scale needs to be undertaken before final conclusions on market potential of ‘Orlando Seedless’ can be made.

Literature Cited


EFFECT OF BUNCH AND MUSCADINE GRAPE MATURITY ON FINISHED WINE

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Abstract. ‘Stover,’ ‘Conquistador’ (bunch, R. Euvitis) and ‘Welder,’ ‘Noble’ (muscadine, V. rotundifolia) cultivars were harvested at 3 or 4 day intervals over a 3 to 6 week period. Brix, pH, titratable acidity, g sugar/berry and berry weight were followed during ripening. Chemical composition and wine analyses were obtained from these same cultivars at their early, midseason and late harvest periods. Maturity date correlated well with compositional data (R=0.90 to 0.99), except for pH. As ripening progressed, Brix and pH increased, while titratable acidity decreased. This trend was less uniform in the uneven ripening ‘Conquistador’. Composition data obtained with 100 berry samples which were hand crushed and pressed then blended and reanalyzed only approximated subsequent large batch free run and press juice, respectively.

Despite the compositional differences that exist within a cultivar at different stages of maturity, the wine character was not dramatically affected by harvest maturity, if the must was standardized by chaptalization. The maturity-related extremes in grape acidity (and to a lesser extent pH) are attenuated in the wines by cold stabilization (both species) and fermentation (muscadine only). Consequently, mid to late and early to midseason harvesting is recommended for bunch and muscadine grapes, respectively. In all cases crush pH should be restricted to between 3.0 and 3.5.

The chemical make up of raw material is quite influential in wine making and wine quality. The composition of the grapes depends on variety, climate, vineyard management and biochemical processes during grape maturation and can be assessed only by proper sampling techniques (4). The changes in chemical composition of grapes during maturation have been extensively studied (1, 9, 10, 12). Flora and Lane (11) reported that in ‘Cowart’ (a muscadine), as ripeness increased, the titratable acidity declined and pH, percent soluble solids (Brix), juice yield and Brix/acid ratio increased. Carroll and Marcy (8) studied the chemical and physical changes during maturation of muscadines, ‘Noble’ and ‘Carlos’. They reported that Brix, titratable acidity, Brix/acid ratio, pH, fructose,