Cowiche™ (‘PC 7903-2’) Sweet Cherry

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‘PC 7903-2’, more commonly known under the trademarked name, Cowiche™, is a sweet cherry variety released in 2007 by the Washington State University Sweet Cherry Breeding Program for fresh market production. In Pacific Northwest production areas of North America, Cowiche™ blooms moderately late, generally 4 to 7 d after ‘Bing’ (midseason industry standard), whereas harvest timing is usually 3 to 7 d later than ‘Bing’. Cowiche™ is vigorous and has an open canopy with a more pendant growth habit and slightly higher precocity than ‘Bing’. Its productivity on Gisela™ 5 rootstock is similar to Chelan™’s but higher than that of ‘PC 7417-9’. Cowiche™ produces very large red-purple fruit that are firm and have excellent eating quality characterized by high soluble solids and acidity. Consumer taste panels have described its flavor as “intense.” Cowiche™ is not self-fertile, but its uncommon S-allele combination, S5S9, currently places it in the same incompatibility group with only one cultivar, Krupnoplodnaya, making it cross-compatible with any moderately late-blooming commercial cultivar.

Origin

‘PC 7903-2’ sweet cherry (Prunus avium L.) was developed at the Washington State University Irrigated Agriculture Research and Extension Center (WSU-IAREC) in Prosser, WA. The goal of the breeding program is to develop new high-quality cultivars adapted to the Pacific Northwest growing regions. The specific objective of the program apart from improving texture and flavor is to extend the harvest window of sweet cherries through development of a range of early-, mid-, and late-season varieties that fit into different target market classes. ‘PC 7903-2’ was selected from among several seedlings that resulted from a controlled cross of ‘PC 7147-4’ (female parent, not patented) and ‘PC 7146-11’ (male parent, not patented) (Fig. 1) made in 1979 by Tom Toyama, the former stone fruit breeder at WSU. The original seedling tree located at block D 40 at the Roza experimental farm (lat. 46.2° N, long. 119.7° W), WSU-IAREC, Prosser, was first asexually propagated by grafting onto a ‘Mazzard’ (P. avium) rootstock at Prosser in 1985. Additional test trees were propagated on various clonal rootstocks in 1995 and again in 1998 and planted in a variety trial as five tree plots in a completely randomized design for evaluation of yield and fruit quality in Prosser, WA, and at The Dalles, OR (lat. 45.6° N, long. –121.2° W). ‘PC 7903-2’ subsequently was released in Oct. 2007 by the Washington State University Agricultural Research Center and patented (USPP 21, 073) on 22 June 2010.

The objective descriptors were provided by WSU as part of the patent application for ‘PC 7903-2’. This information can be found online at <http://www.freepatentsonline.com/PP21073>. A summary of the important characteristics is presented below. All color descriptions are based on the Royal Horticultural Society (RHS) color chart (RHS, 1995) unless otherwise stated. On a ‘Mazzard’ (Prunus avium) rootstock, Cowiche™ is a vigorous, moderately precocious, and moderately productive cherry with a growth habit similar to ‘Bing’ but slightly more spreading. It has a tremendous capacity to set fruiting spurs near the tip of 2-year-old fruiting wood. Leaves are medium to long, elliptical with an acute tip, a rounded base, and serrated margins. The ratio of petiole length to blade length is 0.38. Both the upper and lower surface of the petiole are light red (166A/B) in color. There are two large kidney-shaped, grayed purple (185A) nectary glands at the base of each leaf. Flower buds are conical in shape, four to eight per spur, and grayed orange (177A) in color. Cowiche™ is not self-fertile (the S-locus genotype is S5S9) and generally blooms 4 to 7 d after ‘Bing’. Fruits of Cowiche™ are large (≤12 g), cordate in shape, asymmetrical, have a pointed pistil end, and an indistinct suture (Fig. 2). Pedicel length is short (≤21 mm) with a very thin diameter. Fruit skin is red-purple (59A) in color at maturity, thin, smooth, tenacious to flesh, has abundant lenticels, and a moderate tendency to crack after rain. The flesh is firm, slightly fibrous, melting, very juicy, dark red (53A) in color, and has excellent eating quality. The stone is large, broad elliptical, and grayed yellow (161D) in color. No resistance to common Pacific Northwest diseases such as powdery mildew and bacterial canker has been noted.

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Table 1. Comparisons of fruit characteristics between Cowiche™ and ‘Bing’ grown on ‘Gisela® 6’ rootstock at The Dalles, OR, cemetery block.\(^x\)

<table>
<thead>
<tr>
<th>Cultivar</th>
<th>PFRF (g)</th>
<th>TSS (%)</th>
<th>TA (%)</th>
<th>Fruit mass (g)</th>
<th>Firmness (g•mm(^{-1}))</th>
<th>Harvest date</th>
<th>Full bloom date</th>
<th>Skin/flesh color(^z)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cowiche™</td>
<td>1,481 ± 1.9</td>
<td>222.2 ± 1.2</td>
<td>230.0 ± 0.02</td>
<td>299 ± 0.9</td>
<td>13 July ± 1.6</td>
<td>20 April ± 2.3</td>
<td>5.8/5.0</td>
<td></td>
</tr>
<tr>
<td>Bing</td>
<td>1,017 ± 2.2</td>
<td>186.0 ± 0.3</td>
<td>299.9 ± 0.01</td>
<td>286 ± 0.4</td>
<td>6 July ± 1.0</td>
<td>17 April ± 1.5</td>
<td>5.5/5.0</td>
<td></td>
</tr>
</tbody>
</table>

\(^x\)Trees were in the fourth leaf at the beginning of evaluation and trait values were based on samples of 25 fruit from three Cowiche™ trees and five ‘Bing’ trees averaged over 5 years from 2009 to 2013.

\(^y\)Data presented are means ± se. Means were separated by Tukey’s honest significant difference test at α = 0.05. Means with the same letter (within columns) are not significantly different at P < 0.05.

\(^z\)Twenty-nine millimeter diameter or greater is the desired marketable fruit size for Pacific Northwest fresh sweet cherries. Fruit were treated with 20 ppm gibberellic acid at Bing straw color.

PFRF = pedicel-fruit retention force; TSS = total soluble solids.

Performance

Twenty-five fruit samples harvested annually at commercial maturity from each of five trees of Cowiche™ and ‘Bing’, grafted on ‘Mazzard’, were evaluated in Prosser between 2002 and 2006, and in 2009 and 2013, for fruit quality attributes including fruit mass, total soluble solid (TSS) content, titratable acidity (TA), fruit firmness and harvest date, full bloom date, and fruit skin/flesh color for Cowiche™ and ‘Bing’ sweet cherries grown on ‘Mazzard’ rootstock at WSU-IAREC Prosser, WA.\(^x,y\)

\(^x\)Data were based on fruit with no gibberellic acid spays.

\(^y\)CTIFL color categories: 1 = pink, 2 = red, 3 = red mahogany, 4 = light mahogany, 5 = mahogany, 6 = dark mahogany, 7 = black.

\(^z\)Means are based on 2011, 2012, and 2013 data combined and five trees of each genotype planted as five-tree plots in a completely randomized design. Trees were in the fourth leaf at the beginning of evaluation and trait values were based on samples of 25 fruit from five trees of each cultivar averaged over 10 years from 2002 to 2006 and 2009–13. Note that PFRF was only evaluated from 2009 to 2013 y.

\(^\)Trunk cross-sectional area taken 30 cm aboveground.

\(^\)Means with the same letter (within columns) are not significantly different at P < 0.05.