‘WA 5’ is a new eye-catching apple with a bright orange–red stripe covering 60% to 90% of the yellow background. It exhibits russet, sunburn, or bitterpit and has small and inconspicuous lenticels. Fruit of ‘WA 5’ has excellent texture. It is firmer, crisper, and juicier than ‘Gala’ and maintains its texture in storage and on the shelf. Fruit is round and generally intermediate in size (smaller than ‘Fuji’ and ‘Braeburn’ but larger than ‘Gala’). ‘WA 5’ fruit ripens in early to mid-September in central Washington and its exceptional texture and eye-catching appearance particularly suit the fresh market.

Origin

‘WA 5’ originated from a cross between ‘Splendour’ and Co-op 15 (Fig. 1) made in 1994 at Corvallis, OR, by Shawn Mehlenbacher. The seed was transferred to the Washington State University Tree Fruit Research and Extension Center (TFREC), Wenatchee, in 1994 where it was germinated and raised in a greenhouse in 1995. The seedling was transferred to the nursery in May 1995 where it grew until Sept. 1995 when it was budded onto M.9 rootstock. The resulting tree was planted in the Phase 1 seedling evaluation orchard T19 at TFREC (row 10, position 5) in Apr. 1997. Fruit from this original budded tree was observed in 1999, 2000, and 2001 and, based on fruit quality data, ‘WA 5’ was selected for Phase 2 evaluation in Oct. 2001. Buds were taken from the seedling tree and propagated onto M.9 rootstock in Sept. 2002. Five trees were planted at each of three Phase 2 sites in central Washington in Apr. 2004. Further trees were budded in 2005 onto M.9 rootstocks for larger-scale Phase 3 plantings in 2007 at four commercial orchard sites in central Washington. ‘WA 5’ was virus-tested in 2007 at four commercial orchard sites in 2007 at four commercial orchard sites in 2007 at four commercial orchard sites in 2007 at four commercial orchard sites in 2007 at four commercial orchard sites in 2007 at four commercial orchard sites in 2007 at four commercial orchard sites. ‘WA 5’ fruit ripens in early to mid-September in central Washington.

Description and Performance

The 5-year average ‘WA 5’ full-bloom flowering occurred 2 d after that of ‘De-

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moderate spur development. ‘WA 5’ trees are of compact habit with a relatively small trunk cross-sectional area (Table 2), possibly benefiting in commercial plantings from an increased planting density compared with more vigorous cultivars. ‘WA 5’ is very precocious and, if not thinned, will have a tendency to alternate bearing. Management of crop load to avoid overcropping is also recommended to achieve optimum juiciness and sweetness. Annual yield, cumulative yield from 2005 to 2009, and yield efficiency of ‘WA 5’, ‘Gala’, and ‘Fuji’ are compared (Table 2) from an orchard planted in 2004 near Richland in central Washington. ‘WA 5’ is considered hardy for the region (suitable for at least USDA hardness zone 7). Bark is black (RHS 202A) with rough texture and a moderate number of grayed-purple lenticels (RHS N186A). Branches are grayed-orange (RHS 76A) with numerous round, white (RHS 155A) lenticels. Pubescence is present on the terminal two-thirds of new shoot growth and is white (RHS 155E). Internodes range from 2.6 cm to 3.9 cm. Spur development on 2—year-old fruiting branches is considered moderate to light; spurs are elongated and range from 0.5 cm to 10 cm in length.

Leaves are oval with a smooth, glossy upper surface and light white pubescence on the lower surface. Average blade length (of 10 blades) is 10.6 cm and width is 6.1 cm. The leaf tip is cuspidate, its base is rounded, and the margin is double-serrate. Stipules are small and not present on every leaf; their color is the same as the leaf surfaces, the upper surface being RHS 137A green and the lower being 138B green. The midvein is prominent with considerable white downiness on the upper surface; the upper surface color is from the green—white group RHS 157C. Mean petiole length is 36.3 mm with an average diameter of 1.7 mm. Petiole color is green RHS 138D with grayed-purple (RHS 190D) tip. Fruit rarely exhibit russet, bittertip, or sunburn in the apple-growing regions of central Washington.

‘WA 5’ has the optimum genotypic combination (Md-ACS-1 -2/2 and Md-ACO-1 -1/1) for the ethylene pathway genes of 1-amino-cyclopropane-1-carboxylic acid synthase and oxidase (Table 3) that influence fruit firmness retention (Zhu and Barritt, 2008; Y. Zhu, personal communication).

### Availability

Washington State growers can apply to participate in Phase 4 evaluation of ‘WA 5’ until 31 Jan. 2016. Participation is restricted to growers who appear on Washington Apple Commission assessment records and have a federal EIN. Growers with evaluation licenses from federal EIN. Growers with evaluation licenses have access to Phase 5 evaluation of ‘WA 5’.

### Table 2. Annual production, cumulative yield, trunk cross-sectional area, and yield efficiency of ‘WA 5’ trees compared with ‘Gala’ and ‘Fuji’ from a 2004 planting near Richland in central Washington.

<table>
<thead>
<tr>
<th>Cultivar</th>
<th>Yield per tree (kg)</th>
<th>Cumulative yield per tree (kg)</th>
<th>Trunk cross-sectional area (cm²)</th>
<th>Yield efficiency (kg·cm⁻²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>‘WA 5’</td>
<td>4.5</td>
<td>5.1</td>
<td>12.5</td>
<td>15.6</td>
</tr>
<tr>
<td>‘Gala’ (Imperial)</td>
<td>3.5</td>
<td>7.4</td>
<td>14.5</td>
<td>19.6</td>
</tr>
<tr>
<td>‘Fuji’ (Autumn Rose)</td>
<td>6.0</td>
<td>2.0</td>
<td>16.2</td>
<td>14.6</td>
</tr>
</tbody>
</table>

*Mean values from five trees indicating a trend in production; however, data are not robust enough for statistical analysis.

### Table 3. Genotype of ‘WA 5’ and its parents with three polymerase chain reaction-based genetic markers.

<table>
<thead>
<tr>
<th>Cultivar</th>
<th>Marker genotype</th>
</tr>
</thead>
<tbody>
<tr>
<td>‘WA 5’</td>
<td>Md-ACS-1 -2/2</td>
</tr>
<tr>
<td>‘Splendour’</td>
<td>Md-ACO-1 -1/1</td>
</tr>
<tr>
<td>‘Co-op 15’</td>
<td>Md-Exp-2</td>
</tr>
</tbody>
</table>

*Genotype, ‘WA 5’ being homozygous for both genes.

*Allele size of the amplified fragment measured in bps.
can transfer their license to a Phase 5 commer-
cialization license from 31 Jan. 2012. Application forms and further information can be obtained from Kate Evans or the Washington Tree Fruit Research Commission (<http://www.treefruitresearch.com>).

**Literature Cited**


