Apple Maturity Assessments 2020:
Honeycrisp and Crimson Gala
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These past days we have been sampling fruits from Honeycrisp and Crimson Gala for monitoring fruit maturity. As you can see in the summary table below, we evaluated Honeycrisp grafted on V1, G11 and G969 which was harvested at the Western Maryland Research & Education Center at Keedysville, MD as well as Honeycrisp grafted on M26 harvested in Aspers, PA. Additionally, we harvested and evaluated fruit from Crimson Gala grafted on M9 from Aspers, PA.

<table>
<thead>
<tr>
<th>Location</th>
<th>Cultivar</th>
<th>Date</th>
<th>Rootstock</th>
<th>Diameter (in)</th>
<th>Skin Red Color (% blush)</th>
<th>DA Index</th>
<th>Firmness (lbs)</th>
<th>Starch Index (Cornell 1-8)</th>
<th>Soluble Solids (%)</th>
<th>Acidity (% Malic Acid)</th>
<th>Pictures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Keedysville, MD</td>
<td>Honeycrisp</td>
<td>8/22</td>
<td>V1</td>
<td>2.8</td>
<td>15</td>
<td>1.3</td>
<td>15.8</td>
<td>2.0</td>
<td>10.7</td>
<td>0.6</td>
<td><img src="image1.jpg" alt="Honeycrisp" /></td>
</tr>
<tr>
<td></td>
<td></td>
<td>8/22</td>
<td>G11</td>
<td>2.9</td>
<td>15</td>
<td>1.3</td>
<td>15.4</td>
<td>1.8</td>
<td>10.6</td>
<td>0.6</td>
<td><img src="image2.jpg" alt="Honeycrisp" /></td>
</tr>
<tr>
<td></td>
<td></td>
<td>8/22</td>
<td>G969</td>
<td>2.8</td>
<td>10</td>
<td>1.4</td>
<td>15.9</td>
<td>1.5</td>
<td>10.7</td>
<td>0.6</td>
<td><img src="image3.jpg" alt="Honeycrisp" /></td>
</tr>
<tr>
<td>Aspers, PA</td>
<td>Honeycrisp</td>
<td>8/22</td>
<td>M26</td>
<td>3.1</td>
<td>10</td>
<td>1.4</td>
<td>17.8</td>
<td>1.0</td>
<td>11.6</td>
<td>0.7</td>
<td><img src="image4.jpg" alt="Honeycrisp" /></td>
</tr>
<tr>
<td></td>
<td>Crimson Gala</td>
<td>8/24</td>
<td>M9</td>
<td>2.7</td>
<td>35</td>
<td>1.0</td>
<td>22.0</td>
<td>2.0</td>
<td>10.6</td>
<td>0.4</td>
<td><img src="image5.jpg" alt="Honeycrisp" /></td>
</tr>
</tbody>
</table>

**Honeycrisp Results:**
In general, fruits harvested at Keedysville, MD, are showing very similar results irrespective of the rootstock, with the exception of fruit grafted on G969 which is showing a slight delayed maturity trend as compared to fruit grafted on V1 and G11. Between locations, MD fruit seems to be ahead of fruit from Aspers, PA, as Honeycrisp fruit from PA present lower starch index values, and at the same time, higher firmness and acidity values. For more detailed results on specific quality parameters please read below:
Color:
- Surface color (eye-balling): Honeycrisp fruits are showing a 10-15% of red skin coloration, with not much difference between rootstocks nor location.
- Background color (DA index): Values are ranging between of 1.3-1.4. Readings of 0.60-0.70 are recommended for harvesting fruits for long-term storage. An index of about 0.35 is targeted for harvesting fruit for short-term storage.

Fruits were measured with a DA meter, a device that measures the absorbance difference between 670nm and 720nm light. A higher DA index indicates a larger content of chlorophyll-a in the fruit skin.

Fruit firmness: Honeycrisp fruit assessed in MD are displaying firmness values between 15-16lbs; while Honeycrisp fruit from PA are showing an average of ~2lb higher firmness (17-18lbs). In general, apples that are destined for long-term storage (>3 months) should be harvested with a firmness of at least 15 lbs; while for fruit for shorter-term storage (1-2 months) a firmness of 13-15 lbs is appropriate. Firmness was measured with a penetrometer with a 7/16-inch diameter plunger.

Starch content: The common starch index rating system (Cornell chart) on a scale from 1 to 8, where 1 is full starch (all blue-black) and 8 is starch-free (no stain), was used to evaluate the fruits. Honeycrisp fruit from PA is at the lower end of the scale (1.0), while MD fruits are showing a slightly higher degree of starch disappearance in the flesh as it ranges between 1.5-2. In general, on a 1 to 8 scale, values ranging from 4-6 are recommended for harvesting apples for long-term storage, while 6-7 for fresh market.

Soluble solids contents (SSC): SSC values, measured with a portable refractometer, are showing that fruit harvested in MD, in all rootstocks are averaging 10.5-10.6% SSC; while PA Honeycrisps are averaging 11.6%. These differences can be due to environmental conditions, but also to differences in crop load in the trees. In general, it is recommended to harvest fruits with readings around 12% to 14% SSC.

Acidity: Our results show that the values are similar within rootstocks, with values of 0.6 % malic acid for fruit from MD, while Honeycrisps from PA display slightly higher acidity contents (0.7% malic acid). A decrease in acidity contents is an indicator of advancing maturity. Acidity was measured with an automatic titrator, quantifying malic acid (the major acid present in the juice of apples).

Comparison between Honeycrisp and Crimson Gala Results from PA fruit:
Crimson Galas were evaluated 2 days after Honeycrisp in Aspers, PA. In general, the results show that compared to Honeycrisp, Galas are displaying a higher red skin coloration (35% vs 15%), higher starch index (scale rating of 2 vs 1), lower DA index (readings of 1.0 vs 1.4), and lower acidity (0.4% malic acid vs. 0.7%), which on a first view are all indicators of a more advanced maturity stage. On the other hand, Crimson Galas are also displaying a significantly higher firmness (~22lbs vs. 18lbs for Honeycrisp) which would suggest a less advanced maturity stage.

We will continue monitoring fruit maturity at least for the next two weeks for these two cultivars, to track and report their changes. Although Crimson Gala is displaying advanced maturity in most parameters, it is anticipated that harvests of both cultivars at our sample location should happen close to each other, as Crimson Gala firmness values are still almost 4lbs higher with respect to Honeycrisp. As maturity levels may vary at different locations, we recommend to closely monitor both cultivars over the next weeks.
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