The purpose of this guide is to summarize and explain the U.S. Standards for watermelon. This publication is intended to help producers and shippers grade and pack watermelon. By using this guide, producers will place on the market watermelon with acceptable quality standards. The information in this bulletin was obtained from the “U.S. Standards for Grades of Watermelon.”

**Watermelon Grades**

The three watermelon grades are U.S. Fancy, U.S. No. 1, and U.S. No. 2. Fruit size, shape, maturity, internal quality and other varietal characteristics are considered when applying a grade to a lot of watermelon. Other quality requirements are also important when grading watermelon.

**Size and Other Quality Requirements**

**Defects**

Immature and overripe fruit, and the presence of anthracnose, decay, and sunscald, are considered defects in watermelon of all grades. The presence of other defects, including hollow heart, internal rind spot, rind damage by several means, soft ends, sunburn, transit rubs, and whiteheart, is also considered when grading watermelon. These watermelon defects are described in Table 1. For example, there are descriptions for end and side bruises. To meet the standards for U.S. Fancy and U.S. No. 1 fruit, the bruised area of a 25-pound watermelon must not exceed 3 and 2 inches in diameter on a side and end, respectively. These superficial bruises may be sunken, but they must be contained within the rind. Watermelon with water-soaked flesh do not meet the high quality standards of the U.S. Fancy and U.S. No. 1 grades. For fruit in the U.S. No. 2 grade, a size limit of 5 and 2 inches in diameter is tolerated for water-soaked side and end bruises, respectively.

**Maturity**

Mature watermelons have flesh that is fairly sweet. Note, however, that although the sugar content is one of the most important characteristics of a good-quality melon, according to the standards, the sugar content is only an optional requirement for establishing the grade. Experience indicates that watermelon with less than 10 percent sugar on the Brix scale does not taste very sweet.

Overripe melons are also objectionable. The flesh of overripe melons is mealy and somewhat drier than the flesh of ripe watermelons.

**Shape**

To meet the U.S. Fancy and U.S. No. 1 grade standards, watermelon must have the characteristic shape of the variety, but not necessarily the perfect shape of that variety. To meet the U.S. No. 2 grade standard, watermelon should not be badly misshapen. For example, fruit may be slightly tapered or constricted at an end but not severely constricted.
Table 1. Defects in a 25-Pound Watermelon by Grade Expressed as the Maximum Area or Aggregate Area That May Not Be Exceeded to Maintain the Grade. Damage Is Permitted to Other Size Watermelon in Proportion to Fruit Weight.

<table>
<thead>
<tr>
<th>U.S. Grade</th>
<th>Fancy and No. 1</th>
<th>No. 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bruises</td>
<td>Shrunken bruises 3 inches in diameter.</td>
<td>5 inches in diameter and shrunken or soft and spongy with underlying water-soaked flesh.</td>
</tr>
<tr>
<td>Side</td>
<td>Shrunken bruises 2 inches in diameter.</td>
<td>2 inches in diameter with underlying water-soaked flesh.</td>
</tr>
<tr>
<td>End</td>
<td>Shrunken bruises 2 inches in diameter.</td>
<td></td>
</tr>
<tr>
<td>Hollow heart</td>
<td>Cracks aggregating 1 1/2 inches wide on long or 2 inches on a round melon.</td>
<td>Cracks aggregating 1 1/2 inches on a long or 2 1/2 inches on a round melon.</td>
</tr>
<tr>
<td>Internal rind spot</td>
<td>Aggregate area of a circle 1 inch in diameter.</td>
<td>Aggregate area of a circle of 1 1/2 inches in diameter or when any spot penetrates the flesh.</td>
</tr>
<tr>
<td>Rind damagea</td>
<td>Aggregate area 5 square inches.</td>
<td>Aggregate area 12 square inches.</td>
</tr>
<tr>
<td>Soft ends</td>
<td>End yields readily to slight pressure applied by palm of the hand or shriveling associated with soft end.</td>
<td>No requirement; soft ends permitted.</td>
</tr>
<tr>
<td>Sunburnb</td>
<td>9 square inches of greenish-yellow sunburn.</td>
<td>12 square inches of greenish-yellow sunburn.</td>
</tr>
<tr>
<td>Transit rubs</td>
<td>5 square inches of medium-brown discoloration.</td>
<td>12 square inches.</td>
</tr>
<tr>
<td>Whiteheartc</td>
<td>A circle 1/4 inch in diameter.</td>
<td>A circle 1/2 inch in diameter.</td>
</tr>
</tbody>
</table>

aIncludes hail, rind worm injury, scars, and other defects except anthracnose.
bNot to be confused with sunscald or bleaching of the rind.
cA hard streak of flesh extending through the heart.

Cull any fruit that has a definite bottle- or gourd-shaped neck. Ideal and misshapen round and long watermelon are compared in Figures 1 and 2.

Size

Watermelon size may be described in terms of average weight, minimum weight, or minimum and maximum weight. The weight description determines how tolerances are applied to a lot of watermelon.

Varietal Characteristics

U.S. standards require graded watermelon to have similar varietal characteristics—the same general shape, flesh color, and rind appearance. For example, do not mix round- and oblong-shaped or gray- and striped-rind varieties. Seedless watermelon should not be mixed with seeded watermelon. When growing seedless watermelon, be careful to select a pollinator that is easily distinguished from the seeded variety by the harvesting crew. Orange-fleshed varieties should not be grown or mixed with red-fleshed varieties. The simplest way to meet the varietal requirement is to include only one variety in each lot.

Tolerances for Weight and Other Quality Defects

To allow for differences in grading and handling, tolerances for the presence of defects described above have been established for watermelon at the shipping-point and in transit or at the destination. Tolerances for fruit weight and quality are expressed as the percentage of fruit by number that may not meet standards.

Weight

How the weight of watermelon in a lot is described, whether in terms of average, minimum, or minimum and maximum weight, determines how tolerances are applied to that lot of watermelon (Table 2). The tolerance for size for each description should be made from a sample of 20 watermelon taken from the same container.

• When watermelon size is stated in terms of average weight, and the fruit averages less than 30 pounds, up to 5 percent of the fruit by count in a sample may not vary more than 3 pounds below the stated average.
• When the average weight is 30 pounds, or more, the minimum weight may not be 5 pounds less than the stated average in more than 5 percent of the sample by count.
• When the minimum and maximum weights are specified, no more than 5 percent by count may be below the minimum weight and no more than 5 percent may be above the maximum weight.
Quality

Tolerances for the presence of these defects have been established at the shipping point (or in transit) and at the destination to allow variations in grading and damage during shipping. The shipping point is defined as the point of origin of the shipment in the producing area or at the port of boarding for overseas shipments. In the case of shipments from outside the continental United States, the shipping point is defined as the port of entry.

For example, the presence of defects in U.S. Fancy watermelon on the grower’s farm, the shipping point, is tolerated in up to 8 percent of the fruit (Table 3). Fifty percent of the fruit not meeting the grade requirement, or 4 percent of the number of fruit in the shipment, may be eliminated for serious damage, which detracts from the appearance or edible quality of the fruit. Bruises, hollow heart, internal rind spot and other rind damage, sunburn, soft ends, transit rubs, whiteheart, and other defects may cause serious damage to watermelon up to the limits described in Table 2 for the standards of U.S. No. 2 fruit. Up to 1 percent of the lot, included in the 4 percent tolerance for serious defects, may be culled due to whiteheart, anthracnose, decay, or sunscald. The remainder may be culled for the presence of other defects described in Table 2 listed in the column describing the limits for defects for U.S. Fancy fruit.

At the destination, 10 percent of the fruit may not meet the requirements for the grade. Up to 8 percent of the lot, or 80 percent of the fruit not meeting the requirements, may have permanent defects that are not subject to change during shipping. Permanent defects include scars, hollow heart, and immaturity. One-half of these defects, or 4 percent of the lot, may have serious permanent damage. Two percent of the lot, or 50 percent of the fruit exhibiting serious condition defects, may be culled for anthracnose, decay, sunscald, or whiteheart.

At the destination, up to 8 percent of the lot may also have condition defects. Condition defects, including anthracnose, decay, and sunburn, are subject to change during shipment. One-half of these defects, 4 percent of the total condition defects, may be serious. Up to 2 percent of the lot, or one-half of the serious condition defects, may be due to anthracnose, decay, sunscald, or whiteheart. The remaining 2 percent of fruit may not meet standards for U.S. Fancy fruit described in Table 2. The tolerances for U.S. No. 1 and U.S. No. 2 watermelon are also described in Table 2.

Summary

Watermelon size, shape, varietal characteristics, and the presence of defects are used to grade watermelon. Anthracnose, decay, and sunscald are considered to be defects. Many of the other characteristics used to grade watermelon describe the appearance of the rind. The area of the rind affected by these defects is used to determine the extent of these defects. Tolerances for differences in weight and the presence of defects have
<table>
<thead>
<tr>
<th>Watermelon Weight Pounds</th>
<th>Average Minimum</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>17</td>
</tr>
<tr>
<td>22</td>
<td>19</td>
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<tr>
<td>24</td>
<td>21</td>
</tr>
<tr>
<td>26</td>
<td>23</td>
</tr>
<tr>
<td>28&lt;sup&gt;a&lt;/sup&gt;</td>
<td>25</td>
</tr>
<tr>
<td>30</td>
<td>25</td>
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<tr>
<td>32</td>
<td>27</td>
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<td>34</td>
<td>29</td>
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<td>38</td>
<td>33</td>
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<tr>
<td>40</td>
<td>35</td>
</tr>
<tr>
<td>42</td>
<td>37</td>
</tr>
</tbody>
</table>

<sup>a</sup>For watermelon lots with an average fruit weight of less than 30 pounds, the minimum is 3 pounds below the average. For watermelon lots with an average fruit weight of 30 pounds or more, the minimum is 5 pounds below the average.

<p>| Table 3. Total and Specific Defects in Watermelon Quality Tolerated by Grade and Location of Shipment Expressed as the Maximum Percentage of Fruit by Number in a Lot that May Fail to Meet the Requirements of the Grade. |
|---|---|---|---|
| Specified Limitations | | | |</p>
<table>
<thead>
<tr>
<th>U.S. Grade</th>
<th>Location</th>
<th>Total Defective Defective Included Percent</th>
<th>Maximum Defects Included Percent</th>
<th>Maximum Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fancy</td>
<td>Shipping point</td>
<td>8</td>
<td>Serious damage&lt;sup&gt;a&lt;/sup&gt; 4 Whiteheart, etc.&lt;sup&gt;b&lt;/sup&gt; 1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Destination&lt;sup&gt;c&lt;/sup&gt;</td>
<td>10</td>
<td>Permanent defects&lt;sup&gt;d&lt;/sup&gt; 8 Permanent serious damage 4</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Condition defects&lt;sup&gt;e&lt;/sup&gt; 8 Serious condition 4</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Decay etc.&lt;sup&gt;e&lt;/sup&gt; 2</td>
<td></td>
</tr>
<tr>
<td>No. 1</td>
<td>Shipping point</td>
<td>10</td>
<td>Serious damage 5 Anthracnose 3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Destination&lt;sup&gt;c&lt;/sup&gt;</td>
<td>12</td>
<td>Condition defects 10 Anthracnose 5</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Decay 2</td>
<td></td>
</tr>
<tr>
<td>No. 2</td>
<td>Shipping point</td>
<td>10</td>
<td>Permanent defects 10 Serious damage 5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Destination&lt;sup&gt;c&lt;/sup&gt;</td>
<td>12</td>
<td>Anthracnose 6 - -</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Decay 1 - -</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- -</td>
<td></td>
</tr>
</tbody>
</table>

<sup>a</sup>Serious damage detracts from appearance or edible quality such as the defects described in Table 2, standards for U.S. No. 2 fruit.  
<sup>b</sup>In addition to whiteheart, include anthracnose, decay, and sunscald in the 4 percent limitation for serious damage or condition defects.  
<sup>c</sup>Includes standards for fruit en route to the destination. 
<sup>d</sup>Permanent defects, including scars, hollow heart, immaturity, etc., are not subject to change during shipping and storage. 
<sup>e</sup>Condition defects, including decay, anthracnose, sunburn, etc., are subject to change during shipping and storage.

Reference


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