Module 25
Sizing
Presenter: John Perold

Reference
For more information on fruit sizing equipment and practices, please consult the CRI Production Guidelines, volume IV.

Introduction

After fruit has been treated and waxed in the packhouse, it is separated into different classes and sizes, so that whole cartons and pallets of the same grade and size fruit can be sent to the buyer.

Sizing of citrus fruit can be done mechanically or optically, and there are a range of different machines used for this purpose. The first and most accurate way of sizing citrus fruit that we will look at, is using an optic sizer.

Sizing Equipment

Optic Sizers

It is the most modern sizer at the moment. An optic sizer can size fruit according to colour, shape, size and weight.

The varieties that you are going to pack will influence the sizer that you are going to choose, because if you have very big fruit the pitch between the two fruit, it is going to be too large, as small fruit is going to give you a small pitch. So you need to decide what chains you are going to use to suit your packing needs.

The transfer mechanism is also very important, because fruit is cingulated, and then gets transferred onto the belt. The correct carrier or the cups are also critical, as well as the pitch that is also effective there.
Cingulated

The term cingulated is used to describe any object that is round or ball shaped.

Mechanical Sizers

You then also have mechanical sizers, of which there are three P’s, there are roper, rollers and many other types of sizers that people have build.

Pie Tape

Sizing equipment used to accurately size fruit is the pie tape. The pie tape needs to be checked regularly for accuracy as the band tends to stretch from time to time. What's important about using the pie tape is that we all have quality control people in the packhouse and if they pull on the fruit on the pie tape, you'll see that they will get a different reading.

So understanding how hard to pull on the pie tape is important, so that you can ensure that the circumference of the fruit is being measured equally by yourself and your quality control people.

Monitoring

To check that your sizing is correct, use a sizing sheet on which you indicate the size of fifty separate fruit and the shape of fruit. Remember round and long fruit will fill the box differently. Also indicate the weight of the carton, as a minimum weight is required.
Count References

There are international count references that are used to determine the amount of fruit that must be packed into a carton. If you have a look at the count 88 navel and a count 88 lemon, you’ll see that they both count 88, but the count reference that is referred to, is different.

On soft citrus we have a count, but on the count is also a range, the size range, is indicated to show that those are the only sizes that are allowed into that carton.

Sizing Standards and Requirements

The minimum standards and requirements for fruit sizes allows for a small size difference between fruit in the same carton.

The difference in diameter between the largest and the smallest fruit of the same size reference must not be more than 7 millimetres for lemons.

For oranges the bigger fruit with size reference 0 to 2 is allowed by 11 millimetres between the largest and smallest fruit, for fruit falling into the size reference 3 to 6 it is 9 millimetres and for the smaller fruit falling between size reference 7 and 13, not more than 7 millimetres.

For soft citrus, it may not exceed 9 millimetres for fruit of size reference 1 to 4, 8 millimetres for size reference 5 to 6, and 7 millimetres for size reference 7 to 10.

However, in the case of soft citrus these references are rarely used anymore as there are so many different carton designs with different weights that the diameter range is now indicated on the size reference label. Only fruit within that range may be found in that carton.
Sizing Variations

<table>
<thead>
<tr>
<th>Citrus Type</th>
<th>Size Reference</th>
<th>Size Variation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lemons</td>
<td>All</td>
<td>7mm</td>
</tr>
<tr>
<td>Oranges</td>
<td>0-2</td>
<td>11mm</td>
</tr>
<tr>
<td></td>
<td>3-6</td>
<td>9mm</td>
</tr>
<tr>
<td></td>
<td>7-13</td>
<td>7mm</td>
</tr>
<tr>
<td>Soft citrus</td>
<td>1-4</td>
<td>9mm</td>
</tr>
<tr>
<td></td>
<td>5-6</td>
<td>8mm</td>
</tr>
<tr>
<td></td>
<td>7-10</td>
<td>7mm</td>
</tr>
</tbody>
</table>

active learning

Watch the DVD clips, read through the learning material and do workplace research to gather the knowledge and information to complete the assignments below.

Activity 25.1 – Research Report

Contact a company that supplies optical sizers to the citrus industry. Find out from them what type of machine and what size grader cups should be used when grading and sizing lemons, clementines and navels. Explain why specific cups and machines are used for different citrus types.

Activity 25.2 – Comparison

Study this picture and explain why the counts on the cartons are the same (88), but the count references are different (7 and 3).
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