Module 31
Palletisation – High-Cube versus Standard Stacking

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Background

In the past, fruit were predominantly exported in specialised reefer ships. The height in the decks of these vessels only permitted a pallet height of two meters.

These pallets are referred to as standard pallets, and they were restricted to this height while conventional transportation was utilised.

Recently, with the development of the high-cube integral container, with a height of 2.4 meters, the height of stacks on pallets could be increased by one or two layers of cartons, depending on the carton type. These pallets are called high-cube pallets.

Twenty high-cube pallets could be loaded into a high-cube integral container, while remaining within the maximum permissible height in order to allow for sufficient air circulation within the container.

To load a high-cube container with pallets of 15kg cartons, three standard pallets had to be broken down so that those cartons could be added to twenty other standard pallets to make up high-cube pallets. In the case of 16kg cartons, two pallets were broken down and the cartons added to standard pallets before the container could be loaded.

Receivers began to complain about this practice, because cartons with different counts were ending up on the same pallet. Another issue was that when standard pallets were packed into high-cube containers in this way, there were always a few loose cartons, and these cartons were packed at the back of the container by the doors.

Receivers also began to complain that the loose cartons were being damaged in transit, and that they were a hassle to receive and manage.
High-Cube vs. Standard Stacking

Packhouses and growers also soon realised that the fee charged by the cold store for breaking down standard pallets and building high-cube pallets could be saved by simply stacking high-cube pallets with uniform counts at the packhouse.

This also eliminated the harbour handling charge for the three additional pallets, and addressed the concerns raised by receivers. If the cost saving of doing this at the packhouse is calculated on an FOB basis, it is estimated to be about R1.00 per carton.

Here is a simple comparison to give you some indication of difference in carton load per pallet. From this table we can see that 10 more of both A15C telescopic and open-top display cartons can be stacked on a high-cube pallet.

<table>
<thead>
<tr>
<th>Carton</th>
<th>Number of cartons per pallet</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Standard pallet</td>
</tr>
<tr>
<td>A15C</td>
<td>10 x 7 layers = 70</td>
</tr>
<tr>
<td>Open-top display</td>
<td>5 x 11 layers = 55</td>
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</tbody>
</table>

**FOB Basis**

FOB stands for free on board, and is a trade term used when the seller is required to deliver the goods on board a vessel designated by the buyer. Under an FOB arrangement, the seller fulfils his obligation when the goods pass over the ship’s rail.

**High-Cube Constraints**

We can therefore see that there are cost savings in using high-cube pallets. More cartons can be stacked onto each pallet, saving on per costs of the pallet itself and harbour handling. There is however certain constraints that must be taken into account.
Cold Store Facilities

Port fruit bulk terminals and the older cold stores have racking systems that were built using fixed drive-in type units. These racking systems were built to handle standard height pallets for conventional shipping.

The number of high-cube pallets that are being used has grown substantially over the last three years due to the growth in containerised exports, although a true value of the number of high-cube pallets in relation to the total volume of exports has not been determined.

Cold store facilities have not yet adapted infrastructure sufficiently to handle the volume of high cube-pallets that are being sent. Some facilities have managed to convert a limited number of cold room racking systems to handle high-cube pallets by extending the height of the racking units, but the majority of high-cube pallets sent to these facilities either have the top layer removed from the pallet, or pallets are placed in the centre isle of the bottom tier of a rack location.

The two constraints here are that the top layer cartons are consolidated with other high-cube pallets and then retrieved and placed with the original pallet when the container is packed, and this causes a time delay. The other constraint is that cold store capacity cannot be fully utilised as space is reduced by high-cube pallets that use only the bottom tier of a rack location.

There is also an obvious concern that loose cartons removed from the top layer of the high-cube pallet, may not be successfully returned to their original pallet, which means traceability is compromised.

Carton Stress Levels

During the transport and handling of high-cube pallets, the bottom layer of cartons are subjected to higher stress levels with moisture development in cold rooms weakening the carton strength and resulting in collapsed cartons. Fruit damage and squaring of fruit has been noticed as a result of this. It must be kept in mind that mass load failure tests on cardboard are done on the assumption that standard pallets are used. The extra weight carried by the bottom layer of cartons in high-cube pallets, are not provided for in these tests. Cardboard that only just comply with specifications, may not be strong enough to carry the extra weight.
Please Note

The information in this module was accurate at the time of going to print, which was after the 2009 citrus season. Please enquire about the current high-cube storage capacity of your preferred cold store facility.

Regarding carton stress levels: carton specifications have since been adapted to ensure that cardboard is strong enough to handle the extra weight when high-cube pallets are used. Packhouses must ensure that they use a reputable supplier that manufactures cartons to these specifications.

Conclusion

A grower needs to know how his fruit will be shipped before making the decision on how to stack pallets.

There is a cost saving factor when stacking cartons in a high-cube formation, but this must be weighed against the risks of fruit being damaged and the shortage of storage facilities able to accommodate the pallets.

Active Learning

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

Activity 31.1 – Interview

Interview your packhouse supervisor and find out how many pallets were stacked in standard and how many in high-cube formation during the previous season. Ask him about what he believes to be the benefits of using high-cube pallets. Make notes in your workbook on this responses.
Activity 31.1 – Interview

Interview your packhouse supervisor and find out how many pallets were stacked in standard and how many in high-cube formation during the previous season. Ask him about what he believes to be the benefits of using high-cube pallets. Make notes in your workbook on this responses.

Details of interviewee
Name and surname: 
Date of interview: 
Signature of interviewee: 

[Blank lines for notes]