Carton packs for Granny Smiths

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CONSIDERABLE quantities of Granny Smiths will be exported in carton containers in the 1961 season. Last season an inaugural trial of tray pack cartons was shipped to the United Kingdom but this year will see the first use of cell pack cartons.

Limited packing trials have been conducted recently to determine correct sizing and packing for cell packs and the results of these tests are discussed in this article. A detailed comparison is also made with the tray carton and the Australian Apple Box.

These trials have demonstrated that Granny Smiths can be satisfactorily packed in cells. However, this is the first use of this type of packaging in this State and commercial experience in the coming season will indicate the practical problems involved.
A straight pack for the 2½ Granny Smith apple—a 160 count.

The procedure adopted was to obtain a number of dump boxes of Granny Smiths with a range of sizes, resize the fruit by hand and determine the size range required to give satisfactory packs in cartons and also the net weight obtained in each instance.

CELL PACK CARTONS

The following chart sets out fruit size and count carton size cell arrangement and method of placement of fruit for carton.

<table>
<thead>
<tr>
<th>Size</th>
<th>Count</th>
<th>Carton Dimensions</th>
<th>Cell Arrangement</th>
</tr>
</thead>
<tbody>
<tr>
<td>2½</td>
<td>180</td>
<td>20½ x 12¼ x 10¾</td>
<td>9 x 5 x 4 straight</td>
</tr>
<tr>
<td>2½</td>
<td>160</td>
<td>18¾ x 12½ x 10¾</td>
<td>8 x 5 x 4 crosswise</td>
</tr>
<tr>
<td>2½</td>
<td>140</td>
<td>18¾ x 12½ x 10¾</td>
<td>7 x 5 x 4 crosswise</td>
</tr>
<tr>
<td>2½</td>
<td>128</td>
<td>20¾ x 11¾ x 11¾</td>
<td>8 x 4 x 4 straight</td>
</tr>
<tr>
<td>2½</td>
<td>112</td>
<td>20½ x 11¾ x 11¾</td>
<td>7 x 4 x 4 crosswise</td>
</tr>
<tr>
<td>3</td>
<td>96</td>
<td>18¾ x 11¾ x 12¾</td>
<td>6 x 4 x 4 crosswise</td>
</tr>
</tbody>
</table>

A crosswise pack for the 2½ Granny Smith apple—a 140 count.

It will be noted that cell packs can be packed in ½ inch sizes and thus less packs are involved than either the tray pack carton (identical counts to standard apple box) or the Australian Apple Box. The carton for each count is of a different size and cells are not interchangeable.

Sealing a cell pack carton with special rayon tape. The dispenser enables equal lengths of tape to be neatly applied.
With a suitable stapling machine two staples are positioned in each flap in line with the dividing cell partitions thus obviating damage to the apples.

There appears to be little difficulty in placing all normal shaped Granny Smiths in the cells and should a long type be a little tight it can be evened up by placing a flatter apple in the next cell. There is sufficient flexibility in the cell walls to enable all fruit in the one size range to be packed satisfactorily. Oversized apples will not fit in the cells and must be transferred to the next bin. If they are forced in they will cause the carton to spread and subsequently damage the outside fruits. In a correctly packed cell pack carton the apples should fit firmly enough that a layer may be removed without the centre apples falling out. The nett weight approximated 40 lb.

The experiment proved that the 160 count, a 2½ apple, could be packed from the same bin as the 175 tray pack and the 175 count in the dump box. There are no other similarities with tray pack or dump box.

Reversible trays for the 3-2, 5 x 5—125 count. Counts 100, 125, 150 and 175 use reversible trays.
Non Reversible trays for 3-2, 5 x 4—113 count. A tray left begins and ends with three pockets. B tray right begins and ends with two pockets. Counts 113, 138 and 163 use non reversible trays.

Some method of assembling the cells and supplying the cartons to the packers will have to be worked out in handling a commercial consignment. It would appear that cells should be assembled before delivery to the packer. As an illustration the 160 count has 44 pieces of cardboard for constructing the cells namely 16 long, 28 short plus three dividing pads. The different dimensions of cartons for each count emphasises the need for effective organisation of the assembly and delivery of packing materials to the packers and stacking of the final product.

Apples in cell packs are placed on their cheeks either as in the straight pattern pack with stalks towards the packer or crosswise across the carton depending on the count. Quality grading needs careful attention as once an apple is placed in a cell it is very difficult to remove.

Cell packs can be fastened either by stapling or taping. Both methods as illustrated appear satisfactory and would enable the carton to be opened for inspection and refastened.

With care two staples can be positioned in each flap along the dividing cell partitions leaving no possibility of damage to the apples. Arrows could be printed on the cartons to indicate the position for the staples. This would prevent the anvils that pierce the carton before the staple is fixed in position from doing any damage to the apples. A special rayon tape and applicator are required for taping which is easily and quickly applied as an alternative to stapling. To produce a neat seal the tapes must be of even length and carefully applied.

**TRAY PACK CARTONS**

During the 1960 season almost 6,000 tray pack cartons of Granny Smiths were shipped to the United Kingdom. This provided an excellent opportunity of
studying the packing and handling of the tray pack carton as an export container.

The counts from tray pack cartons to be used for this season will range from 175 to 100. Of these counts the 175, 150, 125 and 100 have reversible trays. It is preferable to commence packing with the 2 pockets towards the packer thus enabling the carton to finish with 3 apples away from the packer. This gives a better presentation when opened and displayed for sale. With the other packs 163, 138 and 113, A and B trays are required. For the correct count it is essential to commence with the A tray which has 3 pockets at either end. The B tray commences with two apples and finishes with two.

The height of a tray packed carton is determined by the size of the apples in the trays and it is necessary to pack apples of an even size in each tray otherwise damage to the larger fruits may occur.

Most of the complaints regarding bruising relate to the larger size Granny Smith apples. Unless the fruit is properly sized for tray pack cartons the effect on bruising may be little better than in orthodox packs. Oversize apples will take the pressure in stacking while undersized fruits will move about in the pockets.

As a result of last seasons experience capper trays will be used this year to prevent movement in the top layer and lids will also be fastened to prevent them riding up. The rayon tape mentioned earlier for cell pack could be useful for this purpose.

Trials with flat apples in tray pack have not been very successful as the apples move in the pockets and it has not been possible to reach the required net weights.

Careful stacking of cartons for transit is essential to prevent surface damage to the containers as occurred in some instances last season.
COMPARISON WITH TRAY PACKED CARTONS

The size relationship of the various counts in tray pack and cell pack cartons indicates that the sizing machine settings are only similar for the 2\(\frac{1}{2}\) size, that is the 175 count in the tray pack and the 160 count in the cell pack. The 2\(\frac{3}{8}\) and 2\(\frac{3}{4}\) sizes are normally divided into two counts for each size in the tray pack. That is 163 and 150 for the 2\(\frac{3}{8}\) and 138 and 125 for the 2\(\frac{3}{4}\) apples. In the cell pack all the 2\(\frac{3}{8}\) apples pack satisfactorily as a 140 count and all 2\(\frac{3}{4}\) apples pack a 128 count.

Tray pack cartons on pallets in a cool store last season prior to shipment

The finished Tray Pack cut away to show the trays and position of the fruit.

Diagram of size—count relationship of the tray pack carton and the dump box.
It is a decided advantage to split the sizes in a large packing shed so as to provide more space for the packers by spreading the apples over more bins and from this point of view tray packs could prove easier to handle. It is not possible to set up a sizing machine with two bins together having the same size fruit unless a cut-out is fitted to each bin of the machine. A separate sizing machine would facilitate the handling of cell packs.

AUSTRALIAN APPLE BOX

With one exception namely the 2½ Granny Smiths the sizing for the dump box is quite different to that required for carton packs. Therefore, it will be most difficult to pack cartons and wooden boxes from the one machine and wherever possible separate units for cartons should be used.

Overseas reports emphasise the excessive bruising on large sized Granny Smiths. While this is in part due to the susceptibility of large sizes to bruising too often it is due to jamming all the apples in the last bin into the one case regardless of size. Other instances of bruising are also very often related to oversize fruit in the pack.

Without proper sizing changed methods of packing will not necessarily solve the bruising problem. The cell pack has some advantage in this regard in that oversize apples won't fit into the cells.

The size-count relationship between tray pack cartons and the Australian Apple Box is illustrated in the accompanying diagram.

It will be seen that in both the tray pack carton and dump box considerable overlapping of sizes is necessary to obtain the correct count. Cell packs conform exactly to eighth inch sizes.

ACKNOWLEDGMENTS

Cell pack cartons and fruit for trial purposes were made available by the Fibre Board Promotion Council whose co-operation in this regard is gratefully acknowledged.
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