The preparation of fruit for marketing — part 3—packing the crop

J S. Bloomfield
Department of Agriculture

Follow this and additional works at: https://researchlibrary.agric.wa.gov.au/journal_agriculture3

Recommended Citation
Available at: https://researchlibrary.agric.wa.gov.au/journal_agriculture3/vol3/iss5/10
PACKING is the most important of the factors which contribute towards fruit presentation. It is the skilled job which is the culmination of the grower's efforts to grow and harvest his fruit and prepare it for market. The costs of growing and harvesting the fruit and the purchase of packing materials and cases, have already been incurred before the fruit is packed. The recoupment of these costs, together with further charges for transport and marketing, plus a satisfactory profit margin depends largely upon the skill with which the fruit is packed. To facilitate operations, standard packs have been designed to assist the grower in maintaining uniformity of presentation and by so doing promote the confidence of the buyer and ultimately the consumer.

The almost universal adoption of the mechanical sizer in packing shed practice in recent years, even by the smaller grower has meant that bench packing for most fruits is now seldom practised except for some varieties of pears and soft fruits, such as peaches. Nevertheless, although sizing has now been mechanised, the skilled job of packing must still be done by hand and the packer needs to be fully conversant with the various packs in relation to the variety, size and shape of the fruit.
Fig. 14.—A portable packing stand with metal paper holder attached, is an ideal combination being handled in order to be able to turn out a firmly packed case of the correct height. Where the orchardist is handling his own crop, much valuable time can be lost if he cannot determine quickly the right pack to be used. Once this basic information is obtained, then speed and ease of handling should follow with practice.

PACKING CHARTS

The packing chart is designed to help the grower to decide the pack to be used. These charts, a series of which are included at the end of this publication, have been compiled as the result of extensive experience of packing the various types of fruits and contain all the necessary details needed for producing a satisfactory pack. In the case of apples, considerable variation occurs in the shape of different varieties and a number of charts for apples are therefore included.

It will be seen that all the charts are based on a standard pattern, and refer mainly to the bushel dump case which is the one chiefly used in this State. For certain fruits the ³⁄₄-bushel case is used for local marketing and the ¹⁄₂-bushel dump for export and charts for these cases are included. In the left hand column of the chart is shown the fruit size which is expressed as the diameter of the fruit measured from cheek to cheek. These sizes run in ¹⁄₄in. increments from the smallest size, that is, ¹⁄₈in. for plums, to 4in. for grapefruit. This means that a line of 2¾in. fruit will contain a range of sizes from 2½in. to less than 2¼in.

For export purposes, apples are marked in ¹⁄₄in. sizes. However, it is better for the packer to think in terms of ¹⁄₄in. variations and use the terms 2¾in. rather than a large 2½in. or 2¾in. instead of a large 2¼in.

The pack refers to the relative position of the fruits in the layer. The main packs used in dump and half dump cases are the 3-2 and 2-2, but it will be noted that some charts include 3-3 for small sizes and 2-1 for large sizes.

The system of placement is illustrated in the photographs accompanying the charts from which it will be seen that the 3-2 pack consists of a group of three fruits, placed laterally across the case followed by two fitted into the spaces between them. Groups of three and two fruits are then repeated until the layer is complete. The
PRIMARY PRODUCERS!
Railway wagons are YOUR ASSETS
DON'T WASTE THEM

PROMPT LOADING and UNLOADING means quicker turnaround of wagons.
QUICKER TURNROUND means increased effective wagon loading capacity.
INCREASED CAPACITY means faster and better railway service for all.
BETTER SERVICE is our aim and your need. YOU CAN HELP yourself by helping Railways to keep the wagons moving.

* USE Government Railways Insured Parcels and Cash on Delivery Parcels systems
* ALSO, consign your goods at "Commission's Risk" and safeguard yourself

WESTERN AUSTRALIAN GOVERNMENT RAILWAYS

THE
STATE GOVERNMENT INSURANCE OFFICE

For Motor Vehicle Comprehensive & Workers' Compensation Insurance

194 ST. GEORGE'S TERRACE, PERTH
And at Kalgoorlie and all Clerks of Court

TEL. BA 9966 :: :: :: :: :: Telegrams "WASIO"

Please mention the "Journal of Agriculture, W.A.," when writing to advertisers
PROFIT PROTECTION through Amicide

A 2,4-D SELECTIVE WEED KILLER FOR THE CONTROL OF WEEDS IN CEREAL CROPS AND PASTURES.

Mobilco CHEMICALS PTY. LTD.
DIVISION OF MOBILE INDUSTRIAL EQUIPMENT LIMITED

Head Office: 410-416 Whitehorse Road, Mitcham, Vic. WU 1081 (9 lines)
City Office: 252 Swanston St., Melb. FB 3021 - Sydney: 47 South Pde., Campsie. LF 4209
Brisbane: 22 Thurlow St., Newmarket, N.W.1. LM 3464 - Adelaide: 43 Halifax St.
Perth: 12 Howard St. BF 2971 - Telegraphic Address: “Mobilco”, Reg. all Capital Cities

Please mention the "Journal of Agriculture, W.A." when writing to advertisers
Fig. 16.—WRAPPING APPLES. It should be emphasised that the wrapping takes the form of one continuous movement and not a series of separate operations. (1) The packer picks up the apple in one hand and the wrapping paper is simultaneously picked up in the other hand. (2) The apple is thrown into the centre of the wrap with the calyx of the fruit adjacent to the middle finger. (3) Without altering the position of the fruit, the paper is folded up with the free hand and held in position (4) while the fruit is twisted. (5) At the same time the hands are turned in opposite directions so that the ends of the wrap form the pad on the cheek of the fruit. (6) With the finger still on the calyx to position the fruit (7) the apple is correctly placed in the case (8) while the other hand selects the next fruit to be wrapped.
system of other packs is exactly the same except that the numbers of fruits in the groups vary. Apart from deciding the actual pack, it is also necessary to determine whether a straight or diagonal pack is to be used. These terms refer to the position of the core line of the fruit in relation to the case. Thus in a straight pack, the axis of the fruit is parallel with the sides of the case, while in a diagonal pack the axis run diagonally across the case. Diagonal packs are used for all apples packed in the bushel dump case and for some varieties of plums in the half bushel dump. Straight packs are used for all citrus fruits, pears, many varieties of plums and also apples packed in the standard case. It is usual practice in diagonal packs to face the eyes of fruit in the outside rows outwards and those of inside rows towards the centre.

The layer count indicates the number of fruits in successive rows running lengthwise in the foundation layer. Thus a 3-2 pack 5 x 5 layer will have five rows of five, or 25 fruits in each layer. On the other hand a 2-2 pack 5 x 5 layer will have four rows of five or 20 fruits per layer. In the second layer, the fruit is placed in the pockets formed by the previous layer, and this system is repeated until the required number of layers is obtained. No fruit should be placed directly above a fruit in the previous layer but must rest in the pockets formed by the layer underneath.

The number of layers per case will vary according to the size of the fruit and the type of case being used. Thus in the dump case, whereas small sizes may require eight layers to bring the fruit up to the correct height, large sizes of the same fruit will attain the correct height in five layers.

The total number of fruits per case for each pack is known as the count. The count gives an indication of the relative size of the fruit and in the case of citrus fruits is marked on the cases for this purpose. Apples and pears, however, are marked with the size, although in "standard" cases the count is preferable.

PACKING

Variability in the size of the case can cause considerable trouble to the packer and therefore before an adjustment is made to the sizer to overcome packing difficulties, case sizes should be checked, to ensure that this is not the cause. The main variation is in the width, and many packing sheds have installed small saw benches to cut end boards to uniform size just before using. However, where this is not done the packer should keep a close
watch on case widths and vary the size of fruit packed accordingly. By careful selection of the fruit it is possible from the one bin to successfully pack cases varying in width by up to a quarter of an inch.

The shape of the fruit, irrespective of the variety, has a considerable influence on the pack and therefore, particularly in the case of apples, packing charts have been prepared more on the basis of fruit shape than according to variety. For instance, Cleopatras, which are usually a long type fruit, can in some districts and in some seasons be packed as a medium long fruit, the same as Granny Smiths. It is therefore misleading to speak of the "Granny Smith Chart" or the "Cleopatra Chart," just as it is wrong to think that a certain variety can always be packed to the same chart irrespective of the type of fruit involved.

In the Granny Smith variety, different sizes may exhibit different characteristics. Larger sizes are normally of the medium long type and conical in shape, whereas the smaller sizes are definitely more round. This can cause difficulty in packing the 2\(\frac{1}{2}\)in. size, which may contain a mixture of the two types. By making two packs for this size, namely, a 2-2, 6 x 5 pack for the smaller and rounder 2\(\frac{1}{2}\)in. and a 2-2, 5 x 5 pack for the larger or longer shaped fruit, the difficulty can usually be overcome. In the latter pack a few fruits from the 2\(\frac{1}{2}\)in. bin may be necessary to bring the fruit up to the correct height. In practice in commercial sheds where 2\(\frac{1}{2}\)in. fruit predominates in a line it is usual to separate this size into two bins.

With oranges it is generally found that Navels are rather flatter than Valencia and to maintain a standard count some adjustment to the sizing machine is necessary. Navels are usually decidedly larger than Valencias and when changing from one variety to the other the machine should be altered to give a better distribution of fruit throughout the bins.

The 2-2 pack for small sizes, that is, 2\(\frac{1}{4}\)in. or smaller in any fruit packed in the dump case is always unsatisfactory. Some side slackness is inevitable, while with apples the small pockets formed by this pack are likely to cause extensive bruising. Therefore, for all sizes, 2\(\frac{1}{4}\)in. or smaller 3-2 packs should be used. This applies equally to oranges. For instance the 200 count using the 3-2 pack is much preferred to the 196 count packed 2-2.

Standard packs should be maintained at all times. If packs are not coming to the correct height, the size of the fruit packed should be varied, not the pack. Should a variation in the selection of sizes not be sufficient, then a slight alteration to the machine should be made. Non-standard packs are usually unsatisfactory and waste much time.

To maintain good packouts it is essential that packers have good supplies of fruit at all times. Considerable time can be lost where there is insufficient spread of the fruit along the machine. It is particularly important that packers in commercial sheds be enabled to obtain a good morning tally as in practice it is usually found that a poor morning output is followed by a low afternoon tally. A cull belt fitted within easy reach of the packers will also reduce time wasted in disposing of reject fruit and at the same time minimise damage to the fruit.

It is immaterial which way the packer stands in relation to the bins. Some stand with the left side to the bin, others prefer the reverse. Actually the position depends upon convenience. The fruit should be picked up with one hand and placed in the case with the other, so that if the
fruit is to be picked up in the left hand, then the packer must stand with the left side to the bin. It is of the utmost importance to use both hands equally to give a physical balance, and conserve energy, if speed and a good output are to be achieved. When first learning, a packer should therefore decide upon the most comfortable position, as future success depends largely upon reducing wasted energy and time to a minimum.

Except when packing citrus fruits, corrugated cardboard liners should be used wherever possible as a protection against bruising. Paper linings, especially in dump cases, do not protect the fruit and under these conditions much bruising occurs. The cardboards should be placed with the smooth surface against the fruit. The side cardboards are often a little narrow and should, therefore, be pulled up after the first layer is completed, to ensure that the top layer of fruit will also be protected.

Various types of packing stands are in use and although they vary slightly in design the main features are the same, namely, firm construction, yet readily moveable along the bins. Where the fruit is to be wrapped the paper holder should be a permanent fixture to the stand and horizontally placed at a slightly higher level than the top of the case. The height of the packing stand and the holder should be such as to allow the packer to take up a comfortable position to avoid unnecessary fatigue, and they can with advantage be made adjustable.

In the large apple packing sheds it is the practice for packers to mark the size on the case with white chalk, using the following code:

- A single stroke (1) for 2\(\frac{1}{4}\)in.
- Two strokes (11) for 2\(\frac{3}{4}\)in.
- Three strokes (111) for 2\(\frac{5}{8}\)in.
- A figure three (3) for 3in.

These marks should be kept small and as neat as possible to prevent disfiguring the cases. One large packing shed has developed a system of letters to indicate sizes which seems satisfactory. For export fruit, which requires labelling, it is a good idea for the size to be stamped on the labels by the packers, using stamps conveniently placed either on the packing stand or on counter-balanced pulleys suspended above the bins. In small sheds it is easier to stamp the size on the case before packing.
K·L·G
CORUNDITE
SPARK PLUGS

ARE YOU GETTING THE MOST FROM YOUR DAIRY HERD?

(OR IS MASTITIS REDUCING YOUR OUTPUT?)

YOU SHOULD KNOW THIS ABOUT PENIJEC AND MASTITIS

Penijec is made in TWO STRENGTHS because broadly speaking MASTITIS occurs in TWO FORMS.

1. Common (Streptococcal) Mastitis
2. Stubborn (Staphylococcal) Mastitis

Diagnosis is difficult. Your animal may have both infections. To be sure, HIT HARD with a first dose of strong PENIJEC (110).

WE RECOMMEND:

First day - Penijec 110 followed by daily injections of Penijec 30 until quarter is normal. Animals with past history of stubborn MASTITIS - continued daily treatment with PENIJEC 110 until quarter is normal. Best results are obtained when treatment is commenced without delay.

Be sure always to keep PENIJEC supplies on hand.

Please mention the "Journal of Agriculture, W.A.," when writing to advertisers.

AUSTRALIA'S LARGEST SELLING MASTITIS TREATMENT
NEW DENNIS 10 h.p. TWIN
AUSTRALIA'S MOST MODERN POWER SAW
MOBILE DRIVEN
Has that power, speed and performance required to carry that 42-inch blade so essential to measure requirements of .....
TIMBER INDUSTRY :: CONTRACT CLEARING :: FENCING
5 h.p. CIRCULAR Suitable for the farmer
Both have many auxiliary purposes and attachments, including POST-HOLE BORER, POST-HOLE DIGGER and DRAG ATTACHMENT, if necessary

See Demonstrations at Factory, Maylands

Dennis Power Saws
38 HARDY ROAD, MAYLANDS
TELEPHONE U 1032

It's FREE
Write now for a coloured brochure on the NEW Dennis Power Saws.
Also gives much valuable information on the handling and maintenance of power saws.
Fill in this coupon.

Please send me New Dennis Saw brochure
Name
Address

J. of A. May/June
WRAPPING

Most fruit packed for the local market is forwarded unwrapped but for export lines, other than plums, and certain varieties of apples and pears kept for long storage, wrapping is necessary. Sulphite tissue wraps are used for the majority of fruits, but due to the susceptibility of the Granny Smith to superficial scald, oiled wraps are essential for this variety. Wrapping is desirable for a number of reasons. The packed case is improved in appearance, shrivelling is reduced, while each fruit is isolated from its neighbours and helps to minimise the spread of the various moulds. From the point of view of protection, wraps also play an important part. The pads formed by the tails of the wrapping paper give protection against bruising and during the nailing down operation collectively give a cushion effect to the pack. The green oiled wraps used for Granny Smiths give an attractive appearance to the finished case and coloured wraps similar to the colour of the fruit enhance the presentation of citrus fruits. Printed wraps can also prove very effective.

The size of the wrapping paper should vary with the size of the fruit. Only fruit 3in. and over should be wrapped in 11in. paper. For sizes smaller than 2½in., 9in. paper should be used. This means that the majority of sizes require 10in. wraps.

A convenient type of paper holder is illustrated in this article. The paper is held in position by a weighted needle, which while holding the papers in position allows single wraps to be torn away quickly. This operation is made easier by the use of a finger stall on the middle finger and also by placing the paper so that it tears with the grain rather than across it. The paper should always be used with the polished side outwards.

The wrapping operation is illustrated in the accompanying photographs. Both hands should be used equally throughout the operation. Thus, while one hand picks up the fruit the other takes off the wrapping paper. Having thrown the fruit into the centre of the paper with the eye facing away from the packer, the partly covered fruit is drawn through the hand and finally twisted so that the tail forms a pad on the cheek of the fruit. The fruit is placed in the case with the hand that picks up the paper whilst the other is ready to sort out the next fruit.

A person learning to wrap fruit must be taught the correct method, as bad habits once developed are extremely hard to correct and wrapping can become most laborious unless all unnecessary movements are eliminated. Good packing calls for speed, neatness and careful handling of the fruit and time spent in learning properly will more than compensate the packer. Normally the learner packer requires a season’s work to become conversant with the various types of fruit to be handled.

CONVEYORS

Roller conveyors should play an important part in any packing shed. A permanent arrangement is necessary to convey the packed cases from the packers to the nailing down press. They should be of a convenient distance from the packer and a suitable height to allow transference of the packed case from the packing stand to the rollers with a minimum of effort. Rollers can also be effectively used when unloading or loading fruit. Metal rollers are most common but suitably constructed wooden rollers are also satisfactory and construction costs are much less. Where rollers are not available a wooden stand will be of some benefit as it obviates the necessity of placing packed cases on the floor and lifting them up again.

Fig. 22.—Tapered wooden rollers with an iron frame on a welded support are quite effective.
Pig

This set of portable wooden rollers was constructed by an orchardist.

**NAILING DOWN AND WIRING**

The dump case derived its name from the old method of lidding in which the case was placed on the floor with one end raised on a board and gently dumped to settle the fruit before lidding.

Nailing presses are now extensively used and have become an essential part of packing shed equipment. Most are constructed to handle the dump case, but by slight modification they can be made to accommodate all other types of cases.

Apart from doing a quicker and more efficient job the nailing press helps to conserve shed space by enabling cases to be lidded as they come over the rollers to be stacked.

Considerable bruising can occur in the lidding operation, particularly with apples where high loose packs are being used. A correctly packed dump case of apples should be not more than 1 in. above the top of the case when pressed firmly by hand. Provided the fruit is packed in this way and care is exercised to see that the end fruits are almost flush with the end boards then no bruising should occur in the press. An occasional check should be made to see that bruising is not occurring. Where high packs are necessary, for instance, for oranges, which have not been sweated prior to packing, the sides of the case should be slightly spread by hand so that when pressure is applied the fruit will go down without being damaged by the side boards. In the standard apple and pear boxes the lid is sufficiently thin to ensure that little pressure is applied to the fruit during lidding. A large bulge is a feature of these packs.

The wiring of export fruit is advisable to minimise damage to cases in transit. In the larger sheds it is common practice to wire the cases coming from the nailing press before being stacked. The wires give added support to the nails and therefore should be placed approximately one inch from each end of the case, that is, just inside the end boards. Poor wiring not only detracts from the appearance, but often enables the wires to slip off.

Both nailing down and wiring are specialised operations and some excellent tallies have been recorded.

**LABELLING AND STENCILLING**

An attractive label gives a good finish to a well packed case of fruit and will produce a favourable reaction amongst buyers. Labelling is now used extensively for export fruit and although good stencilling is effective, it does not show to advantage on the red wood cases, which identify Western Australian fruit. Labels must be firmly attached and not likely to lift during transit. Poor labelling can prove a reflection on the contents. For best results, labels should be thoroughly soaked just prior to use and applied with an approved adhesive. By smoothing with a damp cloth, working from the centre of the label, all air bubbles and creases are worked out. Labels should be allowed to dry sufficiently before the cases are packed. Details of variety, size, grade, etc., are best applied by means of rubber stamps with sponge rubber backings.

Stencils are used for all local market fruit. It is necessary that the information on the case should comply with the requirements of marketing regulations. It is much
simpler to use as complete a stencil as possible, rather than a series giving individual detail.

CASE MAKING

Case-making machines have come into general use in the large packing sheds in recent years. The latest automatic machines not only completely make the box, but may be adjusted to construct various types of boxes. Nevertheless a large proportion of fruit cases used are still hand-made. Greater speed and efficiency will be attained in hand making with a satisfactory setup. This includes convenient placement of case timber, good lighting, a nail stripper and a solid bench.

When making dump cases, spaces between side boards should not be excessive or damage to the fruit will result. The top board must be level with the top of the case, but the bottom board of a three piece side may be moved up if necessary to reduce these spaces.

MECHANICAL HANDLING

The value of mechanical handling of fruit both in the packing shed and cool store has been demonstrated in many parts of the world in recent years. The use of fork lift motor-driven trucks has revolutionised the rapid movement of stocks of fruit and many modern plants are incorporating this method of handling in the general design of the packing shed and cool store.

As yet, little has been done in this regard in this State, although some of the larger packing sheds could benefit from improved handling methods. However, greater use could be made of smaller equip-
ment such as hand-operated hydraulic lift trolleys to reduce the amount of individual case handling.

CONCLUSIONS

The presentation of the fruit is the final phase of the year's work for the grower and one which can greatly influence his return. The quality of the fruit, the equipment available to handle it and the skill in managing packing shed operations, will largely determine the final result. A demonstration of the success of the grower is the buyer's demand for his product. The name of the good grower by virtue of the security it provides to the purchaser creates a demand for his fruit. The successful orchardist is known by the article he markets.

I should like to acknowledge the helpful co-operation of the commercial packing sheds and private growers in making equipment available for illustrative purposes, and the Government Photographer, Mr. Craig Balmer, for the photographic work included in this article.

DEPARTMENT OF AGRICULTURE, WESTERN AUSTRALIA

CHART FOR PACKING PLUMS
HALF DUMP CASE

Internal Dimensions—Length 18 ins., Width 7½ ins. Depth 8½ ins.

SANTA ROSA

<table>
<thead>
<tr>
<th>Apples</th>
<th>Pack</th>
<th>Layer</th>
<th>No. of Layers</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>1½</td>
<td>3-3</td>
<td>8x7</td>
<td>7</td>
<td>315</td>
</tr>
<tr>
<td>1½</td>
<td>3-2</td>
<td>7x7</td>
<td>7</td>
<td>245</td>
</tr>
<tr>
<td>1½</td>
<td>3-2</td>
<td>7x7</td>
<td>6</td>
<td>210</td>
</tr>
<tr>
<td>2</td>
<td>3-2</td>
<td>6x6</td>
<td>6</td>
<td>180</td>
</tr>
<tr>
<td>2½</td>
<td>2-2</td>
<td>8x8</td>
<td>5</td>
<td>160</td>
</tr>
</tbody>
</table>

SATSUMA

<table>
<thead>
<tr>
<th>Apples</th>
<th>Pack</th>
<th>Layer</th>
<th>No. of Layers</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>1½</td>
<td>3-3</td>
<td>8x8</td>
<td>7</td>
<td>336</td>
</tr>
<tr>
<td>1½</td>
<td>3-2</td>
<td>8x7</td>
<td>7</td>
<td>263</td>
</tr>
<tr>
<td>1½</td>
<td>3-2</td>
<td>8x7</td>
<td>6</td>
<td>225</td>
</tr>
<tr>
<td>2</td>
<td>3-2</td>
<td>7x6</td>
<td>6</td>
<td>195</td>
</tr>
<tr>
<td>2½</td>
<td>2-2</td>
<td>8x8</td>
<td>5</td>
<td>160</td>
</tr>
</tbody>
</table>

NARRABEEN

<table>
<thead>
<tr>
<th>Apples</th>
<th>Pack</th>
<th>Layer</th>
<th>No. of Layers</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>1½</td>
<td>3-2</td>
<td>8x7</td>
<td>6</td>
<td>225</td>
</tr>
<tr>
<td>2</td>
<td>3-2</td>
<td>7x6</td>
<td>6</td>
<td>195</td>
</tr>
<tr>
<td>2½</td>
<td>2-2</td>
<td>8x8</td>
<td>5</td>
<td>160</td>
</tr>
<tr>
<td>2½</td>
<td>2-2</td>
<td>7x7</td>
<td>5</td>
<td>140</td>
</tr>
<tr>
<td>2</td>
<td>2-2</td>
<td>6x6</td>
<td>5</td>
<td>120</td>
</tr>
<tr>
<td>2½</td>
<td>2-2</td>
<td>5x5</td>
<td>5</td>
<td>100</td>
</tr>
<tr>
<td>2½</td>
<td>2-1</td>
<td>7x7</td>
<td>4</td>
<td>84</td>
</tr>
</tbody>
</table>

WICKSON

<table>
<thead>
<tr>
<th>Apples</th>
<th>Pack</th>
<th>Layer</th>
<th>No. of Layers</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>1½</td>
<td>3-2</td>
<td>7x6</td>
<td>7</td>
<td>228</td>
</tr>
<tr>
<td>2</td>
<td>3-2</td>
<td>7x6</td>
<td>6</td>
<td>195</td>
</tr>
<tr>
<td>2½</td>
<td>2-2</td>
<td>8x7</td>
<td>5</td>
<td>150</td>
</tr>
<tr>
<td>2</td>
<td>2-2</td>
<td>7x6</td>
<td>5</td>
<td>130</td>
</tr>
<tr>
<td>2½</td>
<td>2-2</td>
<td>6x5</td>
<td>5</td>
<td>110</td>
</tr>
</tbody>
</table>

J. S. BLOOMFIELD. Packing Instructor
EASY TERMS . . . LOW DEPOSIT AND PAYMENT PLAN

TRADE-INS ACCEPTABLE

VERY ATTRACTIVELY PRICED FOR CASH

DEUTZ

50 H.P. on Singles or Duals

35 H.P.

60 H.P.—The most advanced Crawler (air cooled)

SOLD WITH GUARANTEED PROMPT EXPERT FIELD SERVICE AND SPARE PARTS, SUPPLY AND DESPATCH

SPECIAL OFFERS

TRACTOR TYRE CHAINS, all sizes, heavy duty Spring Loaded Centres, only £15 per pair.

HOLT CATERPILLAR 2-Ton Pins and Bushes, £45 complete set.

BOMBER TYRES and TUBES, 12-ply, complete with Fabricated Wheels and Removable Rims, 17in. wide, to fit FORDSON Major, £115 per pair.

CATERPILLAR "22," "15" and "D2" Pins and Bushes, £40 complete set.

HANOMAG 28 H.P. 4-Cylinder Bosch Diesel, with P.T.O., P.P., Lights, Working and Transport Speeds, Hydraulic 3-Point Linkage and 3 Implements—1 Adjustable 2-Furrow Plow; 1 Folding 75-Point Harrows; and 11-Tyne Spring Loaded Scarifier, £1,275.

GOOD SECOND HAND TRACTORS

2 CHAMBERLAIN 40 H.P. Kero Models.

2 CATERPILLAR "22."

1 K.-L. BULLDOG with P.T.O., Lights, 6-Speed, Top Class Tyres.

1 LANZ 25 H.P. late Model, with P.T.O., P.P., 6-Speed.

1 K40 STEEL HORSE, overhauled.

1 T.D.9 INTERNATIONAL CRAWLER.

E. C. (Joe) HANCOCK
Tractor Works
159 LORD STREET, PERTH - - B2556

Please mention the "Journal of Agriculture, W.A." when writing to advertisers
PRODUCTS OF FREIGHTERS LTD.

"Finest in Transportation"

Full information from

TRAILER SALES & SERVICE (W.A.) PTY. LTD.
(Sales Division of Freighters Ltd.)
160 Albany Highway, Victoria Park, Perth. Phone M 2141 & M 2298
Also at Melbourne • Sydney • Brisbane • Adelaide • Launceston

Please mention the "Journal of Agriculture, W.A." when writing to advertisers
DEPARTMENT OF AGRICULTURE, WESTERN AUSTRALIA

CHART FOR PACKING ORANGES
DUMP CASE

Internal Dimensions — Length 18 ins., Width 8 ins., Depth 14 ins.

The 2-2 pack for the 200 count and smaller

Approx. Size  
Packet Layer No. of Layers Count

2  3-2  7 × 6  9  293
2t  3-2  6 × 6  9  270
2t  3-2  6 × 5  9  248
2t  3-2  5 × 5  9  225
2t  3-2  5 × 5  8  200
2t  2-2  7 × 6  7  182
2t  2-2  6 × 6  7  168
2t  2-2  6 × 5  7  154
2t  2-2  5 × 5  7  140
2t  2-2  5 × 4  7  126
3  2-2  4 × 4  7  112
3t  2-2  4 × 4  6  96
3t  2-2  4 × 4  6  84
3t  2-1  5 × 5  5  75
3t  2-1  5 × 4  5  68

Remarks
A 7 x 7 layer pack of 315 count can be used for slightly smaller oranges
Select largest oranges for foundation layer
The smallest 2-2 pack must be packed tightly
Some oranges slightly larger than 2t in diameter may be required
Pack loosely
This pack has only 6 layers and must therefore be packed tightly
Pack tightly selecting flatter oranges for foundation layer

This chart has been compiled to standardise the packing of ORANGES.
The 200 count will be packed from the larger 2t in fruit while the 225 from the smaller 2t. Similarly the 154 count will be packed from the larger 2t and the 168 from the smaller 2t.

J. S. BLOOMFIELD, Packing Instructor

DEPARTMENT OF AGRICULTURE, WESTERN AUSTRALIA

CHART FOR PACKING LEMONS
DUMP CASE

Internal Dimensions — Length 18 ins., Width 8 ins., Depth 14 ins.

The 3-2 count = 3-2 pack 2x6 in 9 Layers

Approx. Size  
Packet Layer No. of Layers Count

1t  3-2  6 × 6  9  270
2  3-2  6 × 5  9  248
2t  3-2  5 × 5  9  225
2t  3-2  5 × 4  9  203
2t  3-2  5 × 4  8  180
2t  3-2  4 × 4  8  160
2t  2-2  5 × 5  7  140
2t  2-2  5 × 4  7  126
2t  2-2  4 × 4  7  112
3  2-2  4 × 3  7  98
3t  2-2  3 × 3  7  84
3t  2-2  4 × 3  6  84

Remarks
Some counts as small oranges
Select long shaped lemons for foundation layer
Those 52 packs in 8 layers are most suitable for long shaped lemons
Pack tightly the smallest 2t pack
Some as medium size orange counts
Select long shaped lemons for foundation layer
Good pack for long lemons
Use if lemons are round

This chart has been compiled to standardise the packing of LEMONS.
Due to the shape of lemons it is necessary for the more desirable export sizes to have one more layer than for oranges.

To obtain a satisfactory height the 200 count in 9 layers is preferred to the 200 count in 8 layers. Again a more satisfactory pack is obtained by packing the 2t and 2t in sizes a 52 pack in 5 layers than in a 2t pack in 7 layers.

In lemons the 131 count is the smallest size utilising the 2t pack. With the many shapes of lemons in the different seasons some adjustment to the sizer machine may be necessary to the approximate sizes given in this chart.

J. S. BLOOMFIELD, Packing Instructor.
DEPARTMENT OF AGRICULTURE, WESTERN AUSTRALIA.

CHART FOR PACKING APPLES

AUSTRALIAN APPLE-BOX (DUMP)

Internal Dimensions—Length 18 ins., Width 8½ ins., Depth 14½ ins.

ROUND TYPE—Jonathan.

<table>
<thead>
<tr>
<th>Approx. Size</th>
<th>Pack.</th>
<th>Layer.</th>
<th>No. of Layers</th>
<th>Count</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>2½</td>
<td>3-2</td>
<td>6 x 6</td>
<td>8</td>
<td>260</td>
<td>Pack firmly.</td>
</tr>
<tr>
<td>2¼</td>
<td>3-2</td>
<td>6 x 6</td>
<td>8</td>
<td>240</td>
<td>Contains smallest possible 2½ apples.</td>
</tr>
<tr>
<td>2⅛</td>
<td>3-2</td>
<td>6 x 6</td>
<td>7</td>
<td>210</td>
<td>Pack tightly.</td>
</tr>
<tr>
<td>2½</td>
<td>3-2</td>
<td>6 x 5</td>
<td>7</td>
<td>193</td>
<td>For larger 2½ apples or slightly longer fruit.</td>
</tr>
<tr>
<td>2⅛</td>
<td>3-2</td>
<td>5 x 5</td>
<td>7</td>
<td>175</td>
<td>A SHOW pack, the only pack for the round 2½ apple.</td>
</tr>
<tr>
<td>2½</td>
<td>3-2</td>
<td>5 x 4</td>
<td>7</td>
<td>158</td>
<td>Pack loosely, or alternatively a 2-2 7 x 6 in 6 layers tightly.</td>
</tr>
<tr>
<td>2½</td>
<td>2-2</td>
<td>6 x 6</td>
<td>6</td>
<td>144</td>
<td>For smallest 2½ apples.</td>
</tr>
<tr>
<td>2⅛</td>
<td>2-2</td>
<td>6 x 5</td>
<td>6</td>
<td>132</td>
<td>A good pack for a line of large apples.</td>
</tr>
<tr>
<td>2½</td>
<td>2-2</td>
<td>5 x 5</td>
<td>6</td>
<td>120</td>
<td>Cases of larger sized Jonathans should contain approx. 43 lb. when packed.</td>
</tr>
<tr>
<td>3</td>
<td>2-2</td>
<td>5 x 4</td>
<td>6</td>
<td>108</td>
<td></td>
</tr>
</tbody>
</table>

J. S. BLOOMFIELD, Packing Instructor.

THE CORRECT HEIGHT ABOVE THE TOP OF THE CASE BEFORE LIDING IS ONE INCH FOR THE 3-2 PACK AND ½ OF AN INCH FOR THE 2-2 PACK.

LONG TYPE—Cleopatra.

<table>
<thead>
<tr>
<th>Approx. Size</th>
<th>Pack.</th>
<th>Layer.</th>
<th>No. of Layers</th>
<th>Count</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>2½</td>
<td>3-2</td>
<td>5 x 5</td>
<td>8</td>
<td>200</td>
<td>Shorter apples could be packed, a 220 count.</td>
</tr>
<tr>
<td>2¾</td>
<td>3-2</td>
<td>5 x 4</td>
<td>8</td>
<td>180</td>
<td>For extra long apples.</td>
</tr>
<tr>
<td>2½</td>
<td>3-2</td>
<td>5 x 5</td>
<td>7</td>
<td>175</td>
<td>A good firm pack.</td>
</tr>
<tr>
<td>2¼</td>
<td>3-2</td>
<td>5 x 4</td>
<td>7</td>
<td>158</td>
<td>The only pack for the long 2½ apple.</td>
</tr>
<tr>
<td>2⅛</td>
<td>2-2</td>
<td>5 x 5</td>
<td>7</td>
<td>140</td>
<td>Pack loosely on the flat cheek of the apple.</td>
</tr>
<tr>
<td>2½</td>
<td>2-2</td>
<td>5 x 4</td>
<td>7</td>
<td>126</td>
<td>A 6 x 5 in 6 layers could be used if necessary.</td>
</tr>
<tr>
<td>2⅛</td>
<td>2-2</td>
<td>5 x 4</td>
<td>6</td>
<td>108</td>
<td>A firm pack.</td>
</tr>
<tr>
<td>3</td>
<td>2-2</td>
<td>4 x 4</td>
<td>6</td>
<td>96</td>
<td>Contains the largest 3 in. apples.</td>
</tr>
<tr>
<td>3½</td>
<td>2-2</td>
<td>4 x 3</td>
<td>6</td>
<td>84</td>
<td>A loose pack.</td>
</tr>
</tbody>
</table>

Cleos. vary in length in different districts. Some medium-long packs could be used as alternatives.
A 2½ G.S. 2-2 PACK IN 6 LAYERS.

MEDIUM-LONG—Granny Smith.

<table>
<thead>
<tr>
<th>Approx. Size</th>
<th>Pack</th>
<th>Layer</th>
<th>No. of Layers</th>
<th>Count</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 ⅔</td>
<td>3-2</td>
<td>6 x 5</td>
<td>6</td>
<td>220</td>
<td>A 240 count could be packed with round fruit.</td>
</tr>
<tr>
<td>2 ⅔</td>
<td>3-2</td>
<td>5 x 5</td>
<td>10</td>
<td>200</td>
<td>Pack loosely.</td>
</tr>
<tr>
<td>2 ⅓</td>
<td>3-2</td>
<td>5 x 5</td>
<td>7</td>
<td>175</td>
<td>The only pack for the 2½ G.S.</td>
</tr>
<tr>
<td>2 ⅓</td>
<td>3-2</td>
<td>5 x 4</td>
<td>7</td>
<td>158</td>
<td>Pack loosely.</td>
</tr>
<tr>
<td>2 ⅔</td>
<td>2-2</td>
<td>6 x 5</td>
<td>7</td>
<td>154</td>
<td>The 140 count could be used with long apples.</td>
</tr>
<tr>
<td>2 ⅓</td>
<td>2-2</td>
<td>6 x 5</td>
<td>6</td>
<td>132</td>
<td></td>
</tr>
<tr>
<td>2 ⅔</td>
<td>2-2</td>
<td>5 x 5</td>
<td>6</td>
<td>120</td>
<td>Good firm packs.</td>
</tr>
<tr>
<td>3</td>
<td>2-2</td>
<td>5 x 4</td>
<td>6</td>
<td>108</td>
<td></td>
</tr>
<tr>
<td>3 ⅓</td>
<td>2-2</td>
<td>4 x 4</td>
<td>6</td>
<td>96</td>
<td>Contains the largest 3 in. apples.</td>
</tr>
<tr>
<td>3 ⅓</td>
<td>2-1</td>
<td>6 x 5</td>
<td>5</td>
<td>83</td>
<td>Pack tightly.</td>
</tr>
<tr>
<td>3 ⅓</td>
<td>2-1</td>
<td>5 x 5</td>
<td>5</td>
<td>75</td>
<td></td>
</tr>
</tbody>
</table>

2½ and smaller Granny Smiths tend to be round, whereas the larger sizes are more conical.

FLAT TYPE—Dunns, Yates.

<table>
<thead>
<tr>
<th>Approx. Size</th>
<th>Pack</th>
<th>Layer</th>
<th>No. of Layers</th>
<th>Count</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 ⅔</td>
<td>3-2</td>
<td>7 x 7</td>
<td>8</td>
<td>280</td>
<td>A 3-3 pack of 288 apples could be used if necessary.</td>
</tr>
<tr>
<td>2 ⅔</td>
<td>3-2</td>
<td>7 x 6</td>
<td>8</td>
<td>260</td>
<td>Contains the smallest 2½ apples.</td>
</tr>
<tr>
<td>2 ⅓</td>
<td>3-2</td>
<td>7 x 6</td>
<td>7</td>
<td>228</td>
<td>A good solid pack.</td>
</tr>
<tr>
<td>2 ⅓</td>
<td>3-2</td>
<td>6 x 5</td>
<td>7</td>
<td>193</td>
<td>The only pack for the 2½ flat apple.</td>
</tr>
<tr>
<td>2 ⅓</td>
<td>3-2</td>
<td>5 x 5</td>
<td>7</td>
<td>175</td>
<td>An easy pack for the 2½, or a 2-2 7 x 7 in 6 layers 168 apples.</td>
</tr>
<tr>
<td>2 ⅓</td>
<td>2-2</td>
<td>7 x 6</td>
<td>6</td>
<td>156</td>
<td>For the smallest 2½. Good pack for Yates.</td>
</tr>
<tr>
<td>2 ⅓</td>
<td>2-2</td>
<td>6 x 6</td>
<td>6</td>
<td>144</td>
<td></td>
</tr>
<tr>
<td>2 ⅔</td>
<td>2-2</td>
<td>6 x 5</td>
<td>6</td>
<td>132</td>
<td>Good packs for Dunns.</td>
</tr>
<tr>
<td>3</td>
<td>2-2</td>
<td>5 x 5</td>
<td>6</td>
<td>120</td>
<td></td>
</tr>
<tr>
<td>3 ⅓</td>
<td>2-2</td>
<td>5 x 4</td>
<td>6</td>
<td>108</td>
<td>Contains the largest apples under 3½.</td>
</tr>
<tr>
<td>3 ⅓</td>
<td>2-1</td>
<td>7 x 6</td>
<td>5</td>
<td>98</td>
<td>A solid pack for Dunns.</td>
</tr>
</tbody>
</table>

The sizing of flat fruit is difficult. Extra attention to sizing by the packers is necessary, especially in the smaller bins. Use 9 x 9 wrapping paper on small apples.
DEPARTMENT OF AGRICULTURE, WESTERN AUSTRALIA

CHART FOR PACKING GRAPEFRUIT

DUMP CASE

Internal Dimensions—Length 18 ins., Width 8½ ins., Depth 14½ ins.

The 78 count A 2¼ pack 6×4 in 5 Layers

Checks to the Side of Case

The 80 count A 2¼ pack 6×4 in 5 Layers

Styler End to Side of Case

Approx. Pack Layer No. Count Remarks
<table>
<thead>
<tr>
<th>Size</th>
<th></th>
<th>of Layers</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>2-2</td>
<td>5 x 4</td>
<td>7</td>
<td>126</td>
</tr>
<tr>
<td>3½</td>
<td>2-2</td>
<td>4 x 4</td>
<td>7</td>
<td>112</td>
</tr>
<tr>
<td>3½</td>
<td>2-2</td>
<td>4 x 4</td>
<td>6</td>
<td>96</td>
</tr>
<tr>
<td>3½</td>
<td>2-1</td>
<td>6 x 5</td>
<td>5</td>
<td>83</td>
</tr>
<tr>
<td>3½</td>
<td>2-1</td>
<td>5 x 5</td>
<td>5</td>
<td>75</td>
</tr>
<tr>
<td>3½</td>
<td>2-1</td>
<td>5 x 4</td>
<td>5</td>
<td>68</td>
</tr>
<tr>
<td>4</td>
<td>2-1</td>
<td>4 x 4</td>
<td>5</td>
<td>60</td>
</tr>
<tr>
<td>4½</td>
<td>2-1</td>
<td>3 x 3</td>
<td>5</td>
<td>53</td>
</tr>
<tr>
<td>4½</td>
<td>2-1</td>
<td>3 x 2</td>
<td>5</td>
<td>45</td>
</tr>
</tbody>
</table>

This chart has been compiled to standardise the packing of GRAPEFRUIT.

The Remarks Column explains the correct placing of the fruit as shown in the illustrations.

Grapefruit must be packed very firmly because of the shrinkage of the thick skin during storage.

The presentation of the 3½ ins. fruit is best when packed a 2¼ pack in 5 layers an 83 count than the lower 2¼ pack in 6 layers an 83 count.

In the larger sizes a suitable pack can be maintained by sizing to a 1½ of an inch.

With irregular shaped fruit some variation may be necessary to the approximate sizes shown on the chart.

J. S. BLOOMFIELD, Packing Instructor.

ADDITIONS TO THIS SERIES.—Charts for packing pears in both ¾-bushel and half-dump cases are now in preparation and it is hoped that they will be available for distribution before the next packing season. Other charts in preparation show the method of packing mandarins in half-dump cases, and a revision is being made of the packs for tomatoes in ¾-bushel and half-dump cases.

DEPARTMENT OF AGRICULTURE, WESTERN AUSTRALIA

CHART FOR PACKING CITRUS

¾ BUSHEL CASE

Internal Dimensions—Length 24 ins., Width 6 ins., Depth 12 ins., clear of division

LEMONS

The 144 count A 2½ pack 6×4 in 8 Layers

Approx. Pack Layer No. Count Remarks
<table>
<thead>
<tr>
<th>Size</th>
<th></th>
<th>of Layers</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>2-2</td>
<td>4 x 3</td>
<td>8</td>
<td>224</td>
</tr>
<tr>
<td>2½</td>
<td>2-2</td>
<td>3 x 3</td>
<td>8</td>
<td>192</td>
</tr>
<tr>
<td>2½</td>
<td>2-1</td>
<td>4 x 4</td>
<td>7</td>
<td>170</td>
</tr>
<tr>
<td>2½</td>
<td>2-1</td>
<td>4 x 4</td>
<td>6</td>
<td>144</td>
</tr>
<tr>
<td>2½</td>
<td>2-1</td>
<td>4 x 3</td>
<td>6</td>
<td>126</td>
</tr>
<tr>
<td>2½</td>
<td>2-1</td>
<td>3 x 3</td>
<td>6</td>
<td>108</td>
</tr>
<tr>
<td>2½</td>
<td>2-1</td>
<td>3 x 2</td>
<td>6</td>
<td>90</td>
</tr>
</tbody>
</table>

THE ¾ BUSHEL CASE IS A SUITABLE CASE FOR PACKING LEMONS FOR THE LOCAL MARKET

LARGE SIZE LEMONS ARE BETTER MARKETED IN DUMP CASES

MANDARINS

The 144 count A 2½ pack 6×4 in 8 Layers

Approx. Pack Layer No. Count Remarks
<table>
<thead>
<tr>
<th>Size</th>
<th></th>
<th>of Layers</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>3-2</td>
<td>4 x 4</td>
<td>8</td>
<td>320</td>
</tr>
<tr>
<td>2½</td>
<td>3-2</td>
<td>4 x 3</td>
<td>8</td>
<td>280</td>
</tr>
<tr>
<td>2½</td>
<td>2-2</td>
<td>4 x 4</td>
<td>7</td>
<td>254</td>
</tr>
<tr>
<td>2½</td>
<td>2-2</td>
<td>4 x 3</td>
<td>7</td>
<td>224</td>
</tr>
<tr>
<td>2½</td>
<td>2-2</td>
<td>3 x 3</td>
<td>7</td>
<td>196</td>
</tr>
<tr>
<td>2½</td>
<td>2-2</td>
<td>3 x 2</td>
<td>6</td>
<td>168</td>
</tr>
<tr>
<td>2½</td>
<td>2-1</td>
<td>3 x 3</td>
<td>6</td>
<td>126</td>
</tr>
<tr>
<td>2½</td>
<td>2-1</td>
<td>3 x 2</td>
<td>6</td>
<td>108</td>
</tr>
</tbody>
</table>

J. S. BLOOMFIELD, Packing Instructor.