Post-war trends in the citrus industry

F. Melville

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The citrus industry in Western Australia in terms of acreage and production is third in magnitude to pome fruits and grapes. At the present time there are in the vicinity of 390,000 citrus trees planted in commercial orchards in the recognised citrus districts, producing up to half a million bushels per annum. Of the total number of trees 80.7% are oranges; 11.6% lemons; 4.6% grapefruit, and 3.1% mandarins. Production of fruit follows a somewhat similar pattern, except that the proportion of oranges is somewhat less and that of lemons considerably greater than that shown by the number of trees.

During the war years, although citrus growers were able to dispose of their fruit satisfactorily for factory use, due to the demand for citrus juices by the services, orchards generally declined due to lack of attention resulting from shortage of labour and materials. At the conclusion of hostilities the industry was faced with an extensive rejuvenation and replanting programme to return it to anything like pre-war level. The replacement programme was hampered by a shortage of nursery trees, and shortages of materials such as fertilisers and equipment persisted for some time.

In the early post-war years a very useful market opened up in Singapore and, as early as 1946, over 50,000 bushels of oranges were exported. However, the prospect of this new outlet for citrus fruits and the increasing local demand, was insufficient to induce any great expansion even when trees became available in adequate quantities. Large-scale plantings such as occurred under War Service Land Settlement Schemes in other citrus areas in Australia were not considered warranted. In the period which has elapsed since the war, a gradual increase in citrus plantings has taken place, amounting to approximately 6%.

In the meantime, exports of citrus fruits, and particularly oranges, have slowly declined, but have been more than offset by the increased local demand created by a 29% increase in population and greater purchasing power.

In the following discussion of the trends in area and production of citrus fruits, figures supplied by the Government Statistician covering the main commercial citrus areas have been used, covering the ten year period 1945-1954. In the graphical illustrations, figures for 1955 have also been included.

The citrus districts have been grouped into zones of similar climatic and growing conditions, as by this means it is possible to give a clearer picture of what has taken place. These zones consist of Northern, Coastal, Hills and Southern. The Bindoon-Chittering area comprises the Northern zone; the coastal strip from the Swan Valley to Pinjarra is termed Coastal; and Southern consists of Harvey, Donnybrook and Capel. The Hills zone, as the name suggests, takes in all the Hills districts. It has not been possible in some cases, to define the zones exactly, due to the overlap of certain Road Board areas into more than one zone. For instance Maida Vale-Forrestfield could not be separated from Hills, nor Roleystone-Bedfordale from Coastal, but to some extent they compensate each other.

Area of Valencia Oranges

Practically the whole of the increase in citrus plantings which has taken place since the war has been due to new plantings of Valencias. Growers have shown a decided preference for Valencias, so much so that in the ten year period 1945-1954 plantings rose from 143,800 to 191,500...
trees, an increase of 47,700 trees, or 33.2%. The effect of the new plantings is reflected in the proportion of non-bearing trees which remained at a high level throughout this period and in 1954 stood at 18.9%.

This interest in Valencias has extended to all districts, although the degree of planting has varied considerably. A comparison of the four zones is given in Table 1 and depicted graphically in Fig. 1. Of the total increase in Valencias, the Northern zone accounts for 46% followed by Coastal and Hills with 21% each and Southern with 10.5%. It is noteworthy, that although the Coastal zone contains a slightly greater area of Valencias than Northern, the increase in acreage is less than half.

**Table 1**

<table>
<thead>
<tr>
<th>Zone</th>
<th>Percentage of Total Planting</th>
<th>10 year Increase in Plantings</th>
<th>Percentage of Total Increase</th>
<th>Average Production per 100 bearing trees, 5 year period 1960-1954</th>
<th>Percentage of Total Planting</th>
<th>10 year Decrease in Plantings</th>
<th>Percentage of Total Decrease</th>
<th>Average Production per 100 bearing trees, 5 year period 1950-1954</th>
</tr>
</thead>
<tbody>
<tr>
<td>Northern</td>
<td>29.4</td>
<td>22,000</td>
<td>46</td>
<td>122</td>
<td>29.5</td>
<td>...</td>
<td>54.1</td>
<td>136</td>
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<tr>
<td>Coastal</td>
<td>30.1</td>
<td>10,000</td>
<td>21</td>
<td>155</td>
<td>28.4</td>
<td>9,400</td>
<td>54.1</td>
<td>144</td>
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<tr>
<td>Hills</td>
<td>21.5</td>
<td>10,000</td>
<td>21</td>
<td>135</td>
<td>32.6</td>
<td>3,800</td>
<td>21.9</td>
<td>138</td>
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<tr>
<td>Southern</td>
<td>17.8</td>
<td>5,000</td>
<td>10.5</td>
<td>160</td>
<td>7.8</td>
<td>4,900</td>
<td>28.3</td>
<td>140</td>
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</tbody>
</table>

**Table 2**

<table>
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<th>Year</th>
<th>44-45</th>
<th>45-46</th>
<th>46-47</th>
<th>47-48</th>
<th>48-49</th>
<th>49-50</th>
<th>50-51</th>
<th>51-52</th>
<th>52-53</th>
<th>53-54</th>
<th>54-55</th>
<th>Annual Planting Rate, 1950-54</th>
<th>Anticipated Replacement Period</th>
<th>Years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Navels</td>
<td>11.0</td>
<td>7.8</td>
<td>6.2</td>
<td>6.4</td>
<td>8.7</td>
<td>10.3</td>
<td>13.1</td>
<td>12.4</td>
<td>11.8</td>
<td>9.4</td>
<td>9.5</td>
<td>2.2</td>
<td>45</td>
<td>45</td>
</tr>
<tr>
<td>Valencias</td>
<td>17.7</td>
<td>15.8</td>
<td>12.5</td>
<td>12.1</td>
<td>18.6</td>
<td>10.3</td>
<td>24.4</td>
<td>22.5</td>
<td>23.2</td>
<td>18.9</td>
<td>17.6</td>
<td>4.2</td>
<td>24</td>
<td>24</td>
</tr>
<tr>
<td>Lemons</td>
<td>15.3</td>
<td>10.2</td>
<td>9.1</td>
<td>10.3</td>
<td>14.3</td>
<td>13.5</td>
<td>15.3</td>
<td>15.2</td>
<td>14.9</td>
<td>12.9</td>
<td>12.1</td>
<td>2.8</td>
<td>36</td>
<td>36</td>
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<tr>
<td>Grapefruit</td>
<td>19.2</td>
<td>15.0</td>
<td>9.3</td>
<td>8.9</td>
<td>12.4</td>
<td>8.9</td>
<td>8.7</td>
<td>14.0</td>
<td>7.4</td>
<td>4.7</td>
<td>4.3</td>
<td>1.6</td>
<td>63</td>
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<tr>
<td>Mandarins</td>
<td>16.2</td>
<td>14.2</td>
<td>8.0</td>
<td>11.9</td>
<td>13.3</td>
<td>16.9</td>
<td>20.5</td>
<td>23.4</td>
<td>21.7</td>
<td>16.9</td>
<td>16.2</td>
<td>3.9</td>
<td>26</td>
<td>26</td>
</tr>
</tbody>
</table>
FIG 1
VALENCIAS—Total number of trees in the various commercial citrus areas.

FIG 2
NAVELS—Total number of trees in the various commercial citrus areas.
The decided preference for Valencias has brought about a radical change in the proportion of these two orange varieties, as shown in Fig. 3. In 1954 there were 8% more Navels than Valencias, but by 1954, there were 43% more Valencias than Navels. The reason for the swing to Valencias is no doubt related to the relatively higher prices which have operated for this variety on the local market, coupled with more congenial harvesting and a longer marketing period. With Navels the harvest period is short and there is always the hazard of excessive fruit drop during mid-winter.

PRODUCTION OF ORANGES

The production of both Valencias and Navels varies considerably from year to year as is evident from Figs. 4 and 5. Perhaps the most outstanding feature is the very decided effect seasonal variations have on production. It will be noted that both Valencias and Navels show the same upward and downward seasonal trend and this is also reflected in each zone. In other words, a good year for Valencias tends to be good for Navels and vice versa. Generally speaking, in a good year, the production in all districts is up and in a light year, all areas show a downward trend.

Valencia production has gradually increased since 1945 and at present is approximately 20% greater than it was ten years ago. Expansion has taken place in all four zones, but the greatest increase has occurred in the Northern areas. With over 19% of trees still non-bearing, further increases in Valencia production can be expected.

The position with Navels is rather different. Although plantings have decreased considerably, there is very little, if any, corresponding fall in production. Production in Coastal areas appears to be declining, but so far this has been made up by increases in Northern districts. The decline in plantings indicates that new areas are insufficient to balance declining orchards and some reduction in Navel production can therefore be expected in future years.

At what level a new balance between Valencias and Navels will be struck cannot be determined, but with increasing home consumption and the possibility of declining Navel production a stage must be reached when greater interest will be taken in Navel plantings.
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FIG. 4
PRODUCTION OF VALENCIAS IN THOUSANDS OF BUSHELS

FIG. 5
PRODUCTION OF NAVELS IN THOUSANDS OF BUSHELS
ORANGE YIELDS

In Table 1 are shown for each zone, the average yields per 100 bearing trees for the five-year period 1950-1954. The yields of both Valencias and Navels are lowest in the Northern zone. This may be related to the absence of summer irrigation, although in the case of Valencias the greater proportion of younger trees may also be a factor. Yields are highest in the Coastal and Southern areas and intermediate in the Hills. Tree size is probably a factor in the high yields in Southern areas.

LEMONS

Lemon acreage has changed very little in the period since the war. At the end of the war, production was adequate to meet requirements and in the intervening years, the increased demand has been insufficient to induce growers to increase plantings. The rise in population has increased consumption, but probably not proportionately, due to the increased plantings of lemons in home gardens. A useful export trade has been developed with Singapore, but the greatest quantity shipped in any one year is 7,600 bushels. Factory prices for lemons have also in the main been unattractive and have provided little incentive for increased plantings.

In the years prior to 1949 a slight upward trend was noticeable in lemon acreage, but since then the trend has been in a downward direction and in 1955 plantings were only slightly above the post war level. This is shown graphically in Fig. 6 which also gives the distribution of plantings. It will be noted that the majority of lemon orchards are located in the Coastal (42.7%) and Hills (44.3%) areas. The Northern and Southern zones contain only 6.2% and 7.5% respectively. The proportion of non-bearing trees has remained in the vicinity of 12-15% during much of the post war period, but the planting rate has been sufficient only to maintain acreage.

Lemon production has varied considerably from year to year, i.e., from just under 81,000 bushels to over 106,000 bushels. This large seasonal fluctuation makes it difficult to assess the trend in production and so far no clear-cut picture is apparent. The light crops experienced recently may prove to be at least in part due to general decline in production. Approximately 90% of the lemons are produced in the Coastal and Hills areas.

GRAPEFRUIT

The demand for grapefruit has never been such as to encourage large plantings of this fruit. Although the total area has fluctuated, the general tendency is in a downward direction as indicated in Fig. 7. The decline is apparent in all zones and is emphasised by the decrease in non-bearing trees which has occurred. In 1955 only 4.3% of trees were non-bearing, as against 19.2% in 1945.

The Northern zone contains 42.5% of grapefruit plantings, Coastal 24.6%, Hills 22.5% and Southern 10.4%.

The effect of decreasing acreage is not as yet reflected in production figures and in recent years crops have tended to increase rather than decrease. Seasonal fluctuations are, however, considerable and any attempt to define the trend could be misleading. Almost 50% of grapefruit production has in recent years come from Northern areas. Coastal is next, closely followed by the other two zones.

MANDARINS

Mandarins are grown mainly in the Coastal zone (45%) and Northern areas (31.4%). The Hills zone contains 15.2% of plantings and Southern 8.0%. In 1955 the total plantings amounted to 18,738 trees. Considerable interest has been shown in mandarins since the war and increased plantings have occurred in all zones with the exception of Southern (Fig. 8). There are now nearly 25% more trees than in 1945 but this does not constitute a very large quantity. Most of the increase has occurred in Coastal and Northern areas. As would be expected, the proportion of non-bearing trees has remained at a fairly high level.

Mandarin production fluctuates more than any other citrus fruit—the highest production being 60% greater than the lowest. Owing to the wide variation from season to season, it is not possible to determine the overall trend.
FIG 6

LEMONS — Total number of trees in the various commercial citrus areas

FIG 7

GRAPEFRUIT — Total number of trees in the various commercial citrus areas

FIG 8

MANDARINS — Total number of trees in the various commercial citrus areas
FUTURE TRENDS IN CITRUS PLANTS AND PRODUCTION

Some indication of possible future trends in the citrus industry can be obtained by a study of the percentage of non-bearing trees as shown in Table 2. It will be noted that Valencias have the highest figure, closely followed by Mandarins. Non-bearing Navel trees are proportionately only half that of Valencias, non-bearing lemons about two-thirds, while the figure for grapefruit in the last few years has dropped to a very low level.

If it is assumed that non-bearing trees are five years of age or less, then the average planting per annum may be calculated as shown in the second last column of Table 2. On this basis, the period required for the complete replacement of existing plantings is shown in the last column.

The planting rate for valencias and Mandarins appears adequate to replace existing plantings and allow for some expansion. However, the present planting rate for Navels, lemons and grapefruit appears inadequate to maintain plantings of these fruit at present levels, and as existing orchards go out of production acreage would be expected to decline.

The effect on production is not so easy to discern, owing to the large seasonal fluctuations which occur in all citrus fruits. However, bearing in mind the present position of plantings and particularly the proportion of new plantings over recent years, it is anticipated that the production of Valencias and mandarins will increase. Navel and grapefruit production can be expected to fall and lemons will also probably show some decline.

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