Plant quarantine

T. C. Miller
IRRIGATION IN WESTERN AUSTRALIA

Government Controlled Schemes 1953-1954

THE increasingly important part which irrigation is playing in Western Australian agriculture is emphasised by this report on the Government controlled irrigation areas in the Harvey, Collie and Waroona districts.

Irrigated pasture, fodder crops, orchards and vegetable plots have shown a steady increase in acreage over the years, with a marked expansion of production, particularly in the dairying and fat stock spheres.

HARVEY IRRIGATION AREA

The total area irrigated was 10,593 acres, an increase of 1,204 acres on last year. The acre waterings for the year were 53,183, an increase of 6,640 acres. The average number of waterings per acre was 5.02 as compared with 5.12 last year.

The area of irrigated pasture increased by 476 acres to 7,659 acres. The average number of waterings given to this irrigated pasture was 5.83.

This area is showing a very healthy and steady increase in production and land utilisation and it is anticipated this trend will continue and increase in tempo for some time to come.

COLLIE IRRIGATION AREA

The area irrigated was 9,063 acres an increase of 117 acres on the previous season. The acre waterings were 44,374, a decrease of 561 acres. The average number of waterings per acre was 4.90 compared with 5.02 the previous year.

Irrigated pasture increased in area by 91 acres and the average number of waterings was 6.41 compared with 6.58 the previous year.

Due to a shortage of water in Wellington Dam, which supplies this area, a system of rationing is introduced each season to eke out supplies. From the end of March, only 50 per cent. of available water is supplied to perennial pasture, the balance being reserved for early winter feed potatoes and vegetables etc. This factor accounts for the low rate of increase in perennial pasture.

Therefore much further expansion and increased production cannot be effected here until the water storage is increased by the raising of the Wellington Dam.
### 1952-53 AND 1953-54 IRRIGATION WATER UTILISATION FIGURES.

**Western Australian Government-controlled Schemes.**

<table>
<thead>
<tr>
<th>District</th>
<th>Permanent Pasture</th>
<th>Dry Land for Early Winter Feed</th>
<th>Fodder</th>
<th>Potatoes</th>
<th>Vegetables</th>
<th>Pumpkins</th>
<th>Orchards/ Vines</th>
<th>Softening</th>
<th>Total Acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collie</td>
<td>5,510</td>
<td>5,601</td>
<td>2,732</td>
<td>2,540</td>
<td>316</td>
<td>109</td>
<td>323</td>
<td>106</td>
<td>108</td>
</tr>
<tr>
<td>Harvey</td>
<td>7,183</td>
<td>7,659</td>
<td>1,137</td>
<td>1,904</td>
<td>425</td>
<td>387</td>
<td>458</td>
<td>140</td>
<td>138</td>
</tr>
<tr>
<td>Waroona</td>
<td>2,017</td>
<td>2,182</td>
<td>154</td>
<td>184</td>
<td>325</td>
<td>270</td>
<td>83</td>
<td>269</td>
<td>3</td>
</tr>
<tr>
<td>Total, All Districts</td>
<td>14,710</td>
<td>15,392</td>
<td>3,869</td>
<td>4,144</td>
<td>563</td>
<td>925</td>
<td>731</td>
<td>1,006</td>
<td>522</td>
</tr>
</tbody>
</table>

**Percentage of Land Irrigated**

- 69·60 | 68·23 | 18·30 | 18·38 | 2·06 | 4·10 | 3·45 | 4·45 | 2·45 | 1·45 | 1·74 | 1·28 | 1·11 | 2·22 | 0·51 | 99·95 | 99·98 |

**Acre Waterings**

- 87,046 | 90,312 | 8,445 | 8,333 | 2,235 | 3,435 | 4,185 | 4,405 | 2,588 | 1,492 | 1,507 | 1,070 | 1,072 | 536 | 115 | 106,105 | 110,671 |

**Average Number of Waterings**

- 5·90 | 5·87 | 2·18 | 2·01 | 3·96 | 3·71 | 4·72 | 4·38 | 4·95 | 4·56 | 3·84 | 3·99 | 4·27 | 1·10 | 1·00 | 5·02 | 4·91 |

**Percentage of Water Used**

- 82·03 | 81·60 | 7·95 | 7·55 | 2·10 | 3·10 | 3·94 | 3·98 | 2·43 | 1·85 | 1·36 | 1·00 | 0·97 | 0·50 | 0·10 | 99·95 | 99·99 |

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**Permanent Pastures**—Consist of perennial species such as paspalum, perennial rye grass, cocksfoot, etc., in association with white clover and occasionally strawberry clover.

**Early Winter Feed**—Watering of dry land for early germination of annual pastures, consisting of subterranean clover, annual rye grass and minor clover and grasses.

**Fodders**—Consist of maize, millets, sorghum and sudan grass chiefly.

In 1952-53 pumpkins were included in vegetables.

Land actually graded, 1952-53 season—705 acres by Government power graders, plus 863¼ acres by farmers and contractors. Total, 1,563¼ acres.

Land actually graded, 1953-54 season—964 acres by Government power graders, plus 947 acres by farmers and contractors. Total, 1,911 acres.

Drains channels, etc., excavated—1952-53, 1,104 chains; 1953-54, 1,588 chains.

**Cost of Watering**—Basic rate, £1 2s. 6d. per acre. This sum allows two waterings and is a compulsory charge on all irrigated land within the scheme area. All further waterings cost 3s. 9d. per acre.
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  □ Perf-O-Rain Low Pressure Sprinklers.
  □ Lo-Head Gated Pipe for Furrow Watering.
  □ Tow-A-Line on Wheels.
  □ Wheel-O-Rain.

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Address: ____________________________

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<tbody>
<tr>
<td></td>
<td>Stirling</td>
<td>Earth Fill</td>
<td>60</td>
<td>2,250,000,000</td>
<td>8,300</td>
<td>900</td>
<td>2,928</td>
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<td>150</td>
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<td>44,344</td>
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<td>Drakesbrook</td>
<td>Earth Fill</td>
<td>54</td>
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<td>800</td>
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<td>Sampson</td>
<td>Earth Fill</td>
<td>100</td>
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<tr>
<td></td>
<td>Wellington</td>
<td>Concrete</td>
<td>65</td>
<td>8,700,000,000,000</td>
<td>31,500</td>
<td>1,200</td>
<td>28,762</td>
<td>9,288</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>25,254,000,000</td>
<td>92,539</td>
<td></td>
<td></td>
<td>71,750</td>
<td>25,734</td>
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</table>

HARVEY (CENTRE OF IRRIGATION AREAS) RAINFALL.

<table>
<thead>
<tr>
<th>Year</th>
<th>January</th>
<th>February</th>
<th>March</th>
<th>April</th>
<th>May</th>
<th>June</th>
<th>July</th>
<th>August</th>
<th>September</th>
<th>October</th>
<th>November</th>
<th>December</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1951</td>
<td>19</td>
<td>8</td>
<td>2</td>
<td>149</td>
<td>9</td>
<td>55</td>
<td>641</td>
<td>612</td>
<td>252</td>
<td>266</td>
<td>173</td>
<td>5</td>
<td>3,549</td>
</tr>
<tr>
<td>1952</td>
<td>195</td>
<td>8</td>
<td>2</td>
<td>149</td>
<td>9</td>
<td>55</td>
<td>641</td>
<td>612</td>
<td>252</td>
<td>266</td>
<td>173</td>
<td>5</td>
<td>4,011</td>
</tr>
<tr>
<td>1953</td>
<td>97</td>
<td>1,212</td>
<td>1,074</td>
<td>167</td>
<td>60</td>
<td>5</td>
<td>3,747</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Harvey (Centre of Area), Annual Average ... 4,014
Brunswick (South of Harvey), Annual Average ... 4,112
Waroona (North of Harvey), Annual Average ... 4,199
Pinjarra ... ... ... ... ... ... ... 3,764

WAROONA IRRIGATION AREA

The area irrigated was 2,896 acres, an increase of 97 acres on last year. The acre waterings were 13,114 an increase of 41 on last season.

The average number of waterings per acre was 4.53 compared with 4.67 last season. Permanent pasture received an average of 4.54 as compared to 4.77 waterings the previous season.

Although an additional 97 acres were irrigated this season only a small increase in water was required. This is due, no doubt, to the low average number of waterings per acre and the lower percentage of pasture in the district. Waroona with an average of 3.57 waterings per acre.
Fig. 6.—Irrigated white clover, perennial ryegrass and *paspalum* pasture.

Although dryland for early winter feed is not irrigated in this area there is a considerable area, 670 acres, of permanent pasture receiving three or less waterings in a season. This fact is difficult to account for but may be allied with the growing of such species as *Paspalum dilatatum* and couch grass combined. With these species frequent waterings are not normally used. Another aspect is possibly the presence of a milk condensory in the district. As farmers supplying the condensory are not required to meet a milk quota there is no resultant pressure for a bulk of green feed in the late summer as in other areas.

Nevertheless the area is showing a gradual and steady increase in land utilisation and production.

**WATER UTILISATION DATA**

The attached water utilisation figures show that the total area irrigated in the Harvey-Collie-Waroona districts during the past season was 22,552 acres, and increase of 1,418 acres, and that the acre waterings were 110,671, an increase of 4,566 with an average of 4.91 waterings per irrigated acre. The previous season an average of 5.02 waterings has only 73.6 per cent. of the area under pasture, compared with an average for all districts of 85.61 per cent. while considerable areas are utilised for low water requirement crops e.g. pumpkins 269 acres were required. This decrease in the number of waterings is no doubt due to seasonal conditions. In 1952 effective rainfall ceased in October, and the season did not break till the following May. In 1953 effective rainfall did not cease till late November, and the season broke in April of this year. Therefore, the irrigation season was somewhat shorter but considerable drier than in 1952-53 as no effective falls of rain occurred during December-January-February-March.

Of the area of 22,552 acres, 68.23 per cent. was used for permanent pastures, and a total of 90.71 per cent. was used for pastures, clover and fodder crops in connection with dairying, whole milk supplies and fat stock purposes, 92.23 per cent. of water being used for the above purpose.

It is clearly seen that pasture production, both permanent pasture and early germinated annual pastures, under irrigation is our main feature with direct results in dairying, whole milk production and fat stock from these areas.

**LAND GRADING AND IRRIGATION AREAS**

An excellent season was experienced and a total of 1,911 acres were graded, compared with 1,563½ acres the previous season an increase of 347½ acres.

Fig. 7.—“The good old days.” Three horses and a double-furrow disc plough being used in land preparation for grading.
This is a record year’s grading for the State-Government-Power graders handled 964 acres and private contractors and farmers dealt with 947 acres.

The actual use of this land is of interest.

<table>
<thead>
<tr>
<th>Area graded</th>
<th>1952-3</th>
<th>1953-4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vegetables</td>
<td>42</td>
<td>58</td>
</tr>
<tr>
<td>Potatoes</td>
<td>292</td>
<td>366</td>
</tr>
<tr>
<td>Fodder crops</td>
<td>220</td>
<td>431</td>
</tr>
<tr>
<td>Annual pasture</td>
<td>143</td>
<td>153</td>
</tr>
<tr>
<td>Irrigated pasture</td>
<td>582</td>
<td>700</td>
</tr>
<tr>
<td>Fallow</td>
<td>284</td>
<td>203</td>
</tr>
</tbody>
</table>

The above shows that the bulk of this land is put to immediate use and therefore has a direct influence on production from these areas.

Grading costs for work done by farmers and contractors are not available, but for work by Government-Power-Graders the following figures are of interest.

The farmers were charged £4 per hour for the hire of these machines, the same as last season, plus £5 2s. 6d. per hour on drainage work not connected with grading. The average cost per acre to grade by power grader was £7 8s. as compared with £6 19s. 6d. the previous season. The average time to grade 1 acre was 1.85 hours compared to 1.7 hours the previous season.

These power machines constructed 19 miles 68 chains of farm drains at an average cost of 4s. 4d. per chain. The value of these drains can be appreciated when it is realised that we are irrigating in 40in. rainfall. Of this 40in. rainfall an average of 33in. normally occurs during the months: May-September inclusive. On occasions as much as 20in. has fallen during the month of June with the annual aggregate as high as 60in. Therefore, it can be readily seen how necessary adequate drainage is if waterlogging and/or flooding of land is not to occur.

| Fig. 8.—A very useful and most successful type of grading attachment to a medium-sized farm tractor. This type has been operating in our irrigation areas for many years. |

<table>
<thead>
<tr>
<th>Damage by Spraying Chemicals</th>
</tr>
</thead>
</table>

On a number of occasions damage to cultivated plants has been associated with drift from weed spraying operations, the risk being accentuated by windy conditions. In several cases recently damage to plants has been traced to vapours originating from spraying equipment stored in the vicinity.

The Officer-in-Charge, Weeds and Seeds Branch of the Department of Agriculture (Mr. G. R. W. Meadly) said that the ethyl ester of 2,4-D a type used frequently as a herbicide, is volatile and if left in the tank, boom or hose of spraying equipment can give rise to vapours which may be blown for some considerable distance. The risk is greatest with high temperatures and injury has been caused by vapour arising from chemical spilt on the back of a truck. During February two instances of damage to plants including grape vines, tomatoes and lemon trees have been investigated. In each case the symptoms were typical of those caused by 2,4-D and equipment used for spraying weeds with 2,4-D ester had been stored nearby. No spraying had been undertaken.

With highly susceptible plants such as vines and tomatoes, a small amount of vapour can cause extensive damage and extreme care is essential with the storage of 2,4-D spraying equipment and material when such plants are nearby. This applies in particular to commercial areas where a large monetary loss could be involved.

| Fig. 9.—The same outfit in operation with a full load. |
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