Irrigation in Western Australia: report on Government-controlled areas: 1958-59

H.K. Gibsone
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being that in *E. Carnabyi* the flowers are much smaller, and several (the original description states three) in the umbel. More will be said of this when we deal with *Eucalyptus macrocarpa*. In the interim the writer would be pleased to receive any specimens which the reader may have of this interesting plant.

No. 69—**Tallerack** (*Eucalyptus tetragona* (R. Br.) F. Muell.)

*Indicative* of poor white sandy soil, usually with a gravelly subsoil, the Tallerack extends on the light soil types from Sukey’s Peak just outside Cranbrook, eastward to at least as far as Cape Arid, not far from Israelite Bay. It extends inland as far as Gnowangerup and Borden to the north of the Stirling Range, thence to the Newdegate and Grasspatch districts. Another area of distribution, occurring under the same soil conditions occurs in the lower Hill River area, and from there northwards to Lake Logue.

The plant is usually a mallee 6 to 8 ft. in height, but specimens of 20 to 25 ft. have been recorded on the south coast. The bark is grey and flaky in the lower parts, shedding in rather thick plates; upward it is yellowish-brown and smooth, but the branchlets are covered with a white powdery exudation, which extends to the foliage and flower buds. The leaves are stalked with a thick stalk, seldom above three inches in length and often almost as broad, prominently veined, and rich in oil, but the oil is of low quality and contains but little cineol. The flowers are borne in clusters of three on flat stalks, and the buds are 4-ribbed and the calyx 4-toothed. The bud-cap (operculum) is usually hemispherical, white and smooth. When it has fallen there may be seen inside four small tooth-like projections which may represent the vestiges of the incurved tips of the four petals which have become fused to form the operculum. The stamens are pure white, and in four tufts or bundles alternating with the four teeth of the calyx-tube. The fruits are almost globular in the south coastal forms, but often more urn-shaped in the plants from the west coast.

The name *tetragona* refers to the four angles of the flower-buds.

No. 70—*(Eucalyptus micranthera* F. Muell. ex Benth.)*

*This* mallee bears no accepted vernacular name. The name *micranthera* refers to the small anthers of the flowers. The species was first collected by George Maxwell about 1850 on a white sandpatch, two miles westward from Eyre’s Relief. This latter place is today known as Eyre, and is situated about half way between Cape Arid and Eucla, on the coast roughly southward from Burnabrie Station.

Maxwell described the plant as a mallee 6 to 10 ft. tall. The material was in bud and flower only, no fruits being obtained. Many years later, Mr. H. P. Turnbull on the Alexander River collected further material which was sent to Mr. Maiden at the Botanic Gardens Sydney, and was figured in the “Critical Revision of the Genus Eucalyptus.”

Within the last two years we have received specimens at the State Herbarium from two localities very close to each other, nine to ten miles northward from Esperance. They came from a dwarf mallee 2 or 3 ft. high, and were in bud, flowers and fruit. These were collected separately by Mr. A. R. Main, and Mrs. Stewart within about a year of each other, but the plants in one locality have now been destroyed by cultivation. It would appear that a number of these specimens from the eastern parts of our south coast extend to the Esperance district, as remarked upon in the case of *Eucalyptus scyphocalyx* in a recent number. A point of interest is that the species is very closely related to the Kangaroo Island mallee (*Eucalyptus cneorifolia*) the well known source of eucalyptus oil of high quality. Another point of interest is to be found in the flowers which possess two types of stamens, one long and one short, and with these a certain difference in the size of the anthers. At the present time there is little to remark upon concerning this species.
(Eucalyptus micranthera F. Muell, ex Benth.)

A and B—Branchlets showing leaves, buds, flowers and fruits; C—Buds (enlarged); D—Flower; E—Anthers; F—Fruits; G—Section of fruit

(About 10 miles northward from Esperance, A. R. Main, 1959.)

455
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IRRIGATION IN WESTERN AUSTRALIA

REPORT ON GOVERNMENT-CONTROLLED AREAS, 1958-59

By H. K. GIBSONE, Officer-in-Charge, Irrigation

IRRIGATION in the south-western portion of Western Australia is mainly confined to the coastal plain west of the Darling Range where the three main irrigation districts of Harvey, Collie and Waroona have been established by the State Government. The Government-controlled irrigation areas extend southward from Waroona (70 miles from Perth) to Dardanup (120 miles from Perth) and have an average width of about five miles.

It will be seen by the accompanying table of water utilisation figures that the total area irrigated in all districts during the 1958-59 season was 25,252 acres, a decrease of 168 acres and that the acre waterings were 148,632, an increase of 2,396. The average number of waterings per acre was 5.88 as against 5.75.

Of the total area of 25,252 acres, 75.77 per cent. was used for permanent pastures and a total of 94.7 per cent. was used for permanent pastures, clovers and fodder crops in the production of whole milk and fat stock. Of the water used 88.27 per cent. was for permanent pasture and 96.39 per cent. for dairying and fat stock purposes.

It is interesting to note that over the years the frequency of watering has increased considerably.
Fig. 2.—An irrigated oat crop under controlled grazing by means of electric fences

Fig. 3.—Cattle grazing on irrigated pastures, white clover, perennial ryegrass and paspalum. A supply channel is seen in the foreground.
In the season 1942-43 permanent pasture was watered 4.36 times per acre and all land 3.18 times. In 1958-59 the respective figures were 6.86 and 5.89.

**LAND GRADING AND IRRIGATION AREAS**

In the preparation of land for surface irrigation it is recognised that efficient grading of such land is essential. During the past ten years the Department of Agriculture in co-operation with the Public Works Department has made power graders available to farmers at a cost designed to cover only working expenses.

Each season approximately 100 farmers make use of these machines. Since the commencement of these operations, private contractors have entered the field and play an important part in the field of grading.

During the season, 1,640 acres of land were graded in preparation for irrigation compared with 1,815 acres the previous season. Of this total Government-controlled machines handled 865 acres and farmers and contractors 775 acres.

As shown in the table overleaf, the bulk of this land is put into immediate production and consequently has a direct influence on production from the irrigation areas.
Fig. 6.—Harvey Weir showing the discharge valve supplying water to the Irrigation areas

<table>
<thead>
<tr>
<th></th>
<th>1957-58</th>
<th>1958-59</th>
</tr>
</thead>
<tbody>
<tr>
<td>Permanent Pastures</td>
<td>749</td>
<td>916</td>
</tr>
<tr>
<td>Annual Pastures</td>
<td>268</td>
<td>116</td>
</tr>
<tr>
<td>Fodder Crops</td>
<td>518</td>
<td>396</td>
</tr>
<tr>
<td>Fallow</td>
<td>17</td>
<td>74</td>
</tr>
<tr>
<td>Potatoes</td>
<td>194</td>
<td>97</td>
</tr>
<tr>
<td>Vegetables</td>
<td>49</td>
<td>39</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>20</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total Area Graded</strong></td>
<td><strong>1,815</strong></td>
<td><strong>1,640</strong></td>
</tr>
</tbody>
</table>

Grading costs for work done by farmers and contractors are not available but the figures for Government-controlled machines are of interest.

Farmers were charged £4 per hour for the hire of these machines as against £4 10s. per hour last year. Drainage work and work not connected with the grading of land was charged at £5 2s. 6d. per hour. The average cost to grade one acre was £7 17s. 9d. compared with £7 4s. the previous season. The average time to grade one acre was 1.97 hours compared with 1.59 hours. These figures include land that has been graded more than once.

The Irrigation Areas are districts with an annual rainfall of 40 in. of which about 33 in. occur during May-September inclusive. Rainfall details are given in the following table:

### Rainfall at Harvey (Centre of Irrigation Areas)

<table>
<thead>
<tr>
<th></th>
<th>1956</th>
<th>1957</th>
<th>1958</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>17</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>February</td>
<td>3</td>
<td>14</td>
<td>33</td>
</tr>
<tr>
<td>March</td>
<td>289</td>
<td>72</td>
<td></td>
</tr>
<tr>
<td>April</td>
<td>243</td>
<td>308</td>
<td>150</td>
</tr>
<tr>
<td>May</td>
<td>1,041</td>
<td>635</td>
<td>697</td>
</tr>
<tr>
<td>June</td>
<td>767</td>
<td>1,785</td>
<td>357</td>
</tr>
<tr>
<td>July</td>
<td>1,006</td>
<td>427</td>
<td>1,497</td>
</tr>
<tr>
<td>August</td>
<td>191</td>
<td>562</td>
<td>358</td>
</tr>
<tr>
<td>September</td>
<td>291</td>
<td>240</td>
<td>89</td>
</tr>
<tr>
<td>October</td>
<td>72</td>
<td>280</td>
<td>188</td>
</tr>
<tr>
<td>November</td>
<td>176</td>
<td>14</td>
<td>114</td>
</tr>
<tr>
<td>December</td>
<td>8</td>
<td>9</td>
<td>30</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>4,087</strong></td>
<td><strong>4,363</strong></td>
<td><strong>3,516</strong></td>
</tr>
</tbody>
</table>

Harvey (centre of area)—Annual average 4,014 points.

Brunswick (south of Harvey)—Annual average 4,112 points.

Waroon (north of Harvey)—Annual average 4,109 points.

Pinjarra—Annual average 3,784 points.

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developed for use with Lysaght Silos. With oats
particularly, the Auger is faster and more
economical than bag handling. Operates by
flat belt drive from tractor — and the tractor is
very easily positioned. Easily assembled! De­
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range.
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• Flat Belt drive — pulley
supplied.
• Complete ready for at­
tachment of belt —
guide rollers for belt
provided.
• Designed to fill Silo
from centre of roof —
enabling maximum cap­
acity to be obtained.
• Exceptionally easy to as­
semble and erect.
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IRRIGATION WATER UTILIZATION FIGURES FOR GOVERNMENT CONTROLLED IRRIGATION AREAS, 1957-58 AND 1958-59

<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 and Vines</th>
<th>Softening</th>
<th>Total Acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collie</td>
<td>6,409</td>
<td>6,442</td>
<td>1,837</td>
<td>1,811</td>
<td>302</td>
<td>249</td>
<td>25</td>
<td>10</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>10,012</td>
<td>10,578</td>
<td>1,607</td>
<td>1,385</td>
<td>309</td>
<td>233</td>
<td>10</td>
<td>20</td>
<td>1</td>
</tr>
<tr>
<td>Waroona</td>
<td>2,356</td>
<td>2,514</td>
<td>731</td>
<td>714</td>
<td>325</td>
<td>412</td>
<td>342</td>
<td>250</td>
<td>1</td>
</tr>
<tr>
<td>Total All Districts</td>
<td>18,767</td>
<td>18,914</td>
<td>3,344</td>
<td>3,146</td>
<td>1,318</td>
<td>1,625</td>
<td>1,054</td>
<td>262</td>
<td>1</td>
</tr>
<tr>
<td>Percentage of Land Irrigated</td>
<td>73.63%</td>
<td>75.77%</td>
<td>13.63</td>
<td>12.46</td>
<td>5.97</td>
<td>6.44</td>
<td>1.35</td>
<td>1.04</td>
<td>0.01</td>
</tr>
<tr>
<td>Acre Waterings</td>
<td>126,588</td>
<td>131,188</td>
<td>7,017</td>
<td>5,752</td>
<td>5,384</td>
<td>6,324</td>
<td>1,506</td>
<td>1,346</td>
<td>1,149</td>
</tr>
<tr>
<td>Average Number of Waterings</td>
<td>6.74</td>
<td>6.86</td>
<td>2.03</td>
<td>1.83</td>
<td>3.55</td>
<td>3.89</td>
<td>4.38</td>
<td>2.98</td>
<td>4.21</td>
</tr>
<tr>
<td>Percentage of Water Used</td>
<td>86.56%</td>
<td>88.27</td>
<td>4.80</td>
<td>3.87</td>
<td>3.68</td>
<td>4.26</td>
<td>2.26</td>
<td>1.25</td>
<td>0.99</td>
</tr>
</tbody>
</table>

Permanent Pastures—Consist of perennial species such as paspali, perennial ryegrass, cockfoot, etc., in association with white clover and occasionally strawberry clover.

Early Winter Feed—Watering of dryland for early germination of annual pastures—consisting of subterranean clover, annual ryegrass and minor clover and grasses.

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

Land Graded, 1957–58 season 985 acres Government Power Graders plus 830 acres by farmers and contractors Total = 1,815 acres.

Land graded, 1958–59 season 865 acres Government Power Graders plus 775 acres by farmers and contractors Total = 1,640 acres.

Drains and channels excavated 1957–58 2,300 chains, 1958–59 1,440 chains.

Cost of watering:—Basic rate £1 8s. 9d. per acre. This sum allows two waterings and is a compulsory charge on all irrigated land within the scheme area. All subsequent waterings cost 5s. 9d. per acre.

IRRIGATION RESERVOIRS

<table>
<thead>
<tr>
<th>District</th>
<th>Reservoir</th>
<th>Type</th>
<th>Depth of Water</th>
<th>Capacity</th>
<th>Acre</th>
<th>Crest Length</th>
<th>Area of District</th>
<th>Ultimate Rateable Area</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>feet</td>
<td>gallons</td>
<td>feet</td>
<td>feet</td>
<td>acres</td>
<td>acres</td>
</tr>
<tr>
<td>Harvey</td>
<td>1 Harvy</td>
<td>Concrete</td>
<td>60</td>
<td>2,250,000,000</td>
<td>8,300</td>
<td>797</td>
<td>2,928</td>
<td>2,228</td>
</tr>
<tr>
<td></td>
<td>2 Stirling</td>
<td>Earth Fill</td>
<td>150</td>
<td>12,000,000,000</td>
<td>44,544</td>
<td>900</td>
<td>29,735</td>
<td>10,077</td>
</tr>
<tr>
<td>Waroona</td>
<td>1 Drakesbrook</td>
<td>Concrete</td>
<td>54</td>
<td>504,000,000</td>
<td>1,855</td>
<td>580</td>
<td>10,325</td>
<td>3,441</td>
</tr>
<tr>
<td></td>
<td>2 Sampson</td>
<td>Earth Fill</td>
<td>100</td>
<td>1,800,000,000</td>
<td>6,540</td>
<td>800</td>
<td>28,762</td>
<td>9,288</td>
</tr>
<tr>
<td>Collie</td>
<td>Wellington</td>
<td>Concrete</td>
<td>65</td>
<td>8,700,000,000</td>
<td>31,500</td>
<td>1,200</td>
<td>71,750</td>
<td>25,734</td>
</tr>
</tbody>
</table>

[Table data continued]
work in the construction of drains and channels. Approximately 18 miles of drains were excavated during the 1958-59 season.

**HARVEY IRRIGATION AREA**

The total area irrigated was 12,956 acres as compared with 13,003 acres the previous year. The acre waterings for the season were 79,861, an increase of 1,641. The average number of waterings per acre was 6.17 compared with 6.01 for last year. The area of irrigated pastures increased by 366 acres to 10,378 and the average number of waterings given to irrigated pasture was 7.03 as against 6.94 for last year.

The Harvey area is up to the capacity of the weirs and no increase can be expected until additional storage is provided.

**COLLIE IRRIGATION AREA**

The area irrigated was 9,097 acres, a decrease of 105 acres. The acre waterings were 50,548, an increase of 961. The average number of waterings per acre was 5.56 compared with 5.39 last season. Irrigation pastures remained practically the same, the figure being 6,442 as against 6,470 for last year.

The average number of waterings given to irrigated pasture was 6.84 compared with 6.63 for last year.

Due to a shortage of water in Wellington dam it is necessary to impose restrictions. Except for special crops and stock water no water is available after the end of March. However, work on the raising of the wall of Wellington dam is nearing completion and it is hoped that full supplies will be available for the district next season.

**WAROONA IRRIGATION AREA**

The area irrigated was 3,199 acres as against last year's figure of 3,214. The acre waterings for the season were 18,223, a decrease of 206. The average number of waterings per acre was 5.7 compared with 5.73 for last year. Permanent pasture increased to 2,314 acres. The average number of waterings for permanent pasture was 6.11 compared with 6.22 last season.

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**A DISEASE-RESISTANT CUCUMBER**

Department of Agriculture tests of an American cucumber known as Ohio MR200 have indicated that this variety is highly resistant to the mosaic disease which has long been a serious problem in early cucumber crops in this State.

In experiments carried out at the Vegetable Research Station, Herdsman Lake, the imported variety, grown under severe mosaic conditions, gave eight times the yield of the susceptible local varieties. The percentage of first quality fruits was 85 per cent., compared with 12 per cent., 37 per cent. and nil of three local varieties tested under identical conditions.

The new variety appears to be highly suitable for early planting in mosaic-liable areas, but was not at present recommended for mosaic-free situations or for late planting.

Seed supplies are limited at present and only small trial lots are available.