



# FOREST NOTES

Forests Department Perth Western Australia

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Material printed in this issue of Forest  
Notes cannot be reprinted elsewhere without  
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of W.A.

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88 King George Street  
SOUTH PERTH W.A. 6151

The Editor  
"Forest Notes",  
PEMBERTON

Dear Sir,

JOSEPH WILDE!

West Australian foresters may feel disposed to take all the credit for the establishment of our soft wood plantations! In this regard, I hope Mr. Editor, you will help me restore the memory of a tree pioneer's name, that I fear, has been all but lost in oblivion.

In a land where no natural pines occurred, the "Father of Forestry" in this State, the late C.E. Lane Poole (surely honoured in memory by all that knew him), would have been most acutely aware of the need for establishing softwood plantations. In view of his pre-knowledge of the successful conversion of coastal wastelands in France, with Pinus pinaster plantations, he may have even nursed hopes of a similar experiment in W.A. even before he set foot here.

When he arrived in 1916, he must surely have been most gratified - if not excited- to find several species of well established commercial pines, quite at home in the poor sandy confines of Perth; and one in particular - none other than P.pinaster. This fact must have given him assurance to go ahead, perhaps years sooner than would otherwise have been considered judicious.

The interesting tree-pioneer-character referred to, had (even before Mr. Lane Poole had seen the light of day in this world) experimented with upwards of 23 pine species, of which P. halepensis, Pinea and pinaster were outstanding. He evidently, also, had high hopes of encouraging the silk worm trade with white mulberries, not to mention the introduction of upwards of 100 varieties of fruit trees.

CENTURY OLD!

Whilst researching recently in the Battye Library, I came across the undermentioned "Pines! Pines!" century old

advertisement in "The Enquirer and Commercial News"  
(Perth) of Wednesday, May 31, 1871.

As a matter of historical interest therefore - if not in grateful memory to one who, knowingly or otherwise, has made such an appreciative contribution to one of our most important primary industries, I trust, Mr. Editor, you will grant me space to record the advertisement in full -

"Pines! Pines!

The undersigned begs most respectfully to announce to the gentry and public of Western Australia, that he has succeeded in raising a choice selection of the above valuable plants, which are in a fine healthy condition, and offers them at such prices as will place them within reach of the humblest of our community.

The varieties ready to plant out this season are -  
Pinus Halepensis, Pinus Pinea and Pineaster\*.

The above have outgrown upwards of 20 other varieties of Pines, which were sown at the same time, and which speaks well for their doing well in this climate."

\* As spelt in the advertisement.

"To persons desirous of embarking in Sericulture, if they forward their orders (before June next) for the white mulberry, they can rely upon them being executed, as I am in a position to produce from one to two thousand next season, of these trees should inducement be offered.

I have a few dozen of the black mulberry to offer this year.

I introduced into the colony upwards of one hundred different varieties of fruits last season, with a view to acclimatize them; thus obtaining by actual experience, the kinds that will suit the Colony; such exertions on my part no doubt, will ensure the support of floriculturists.

Prices £3 per 100, or 9s. per dozen; single plants 1/- each.

Orders carefully packed and delivered in Perth  
free of charge.

Terms - cash on delivery

Joseph Wilde  
South Perth

April 28, 1870"

Note to the Editor

I hope it is agreed that we owe it to the Joseph Wildes of the past to record their names and doings for posterity, wherever we discover, or know of them. Likewise there are many colourful characters who have helped put the timber industry and forestry on the map.

Their stories would surely make for some really good "human interest" reading and not only for those that have "followed the game"!

Would this be outside the purpose of "Forest Notes"? It seems it could at least have some historical merit!

If you are disposed that way, I suggest for your consideration that a column be set aside for this purpose and contributions invited - more particularly from the older Forestry men past and present, who can write from first hand experience.

Yours etc,

J.A. Thomson

Editor's Note

Articles and stories such as Mr. Thomson's are far from being outside the scope of Forest Notes. Contributions of this nature are very welcome.

R.J. Underwood.

Forests Department,  
KALGOORLIE. 6430.

The Editor,  
"Forest Notes",  
PEMBERTON

Dear Sir,

Below is a copy of a news item put over on Kalgoorlie radio recently.

"A woodcutter working in thickly timbered country at Deadman's Soak, east of Comet Vale, walked for more than 20 miles after becoming lost on Thursday.

His disappearance was noticed by his partner, who alerted a Forests Department Field Officer, Mr. Bill BRENNAN, while he was inspecting the area.

After advising the Kalgoorlie Police of the situation, Mr. Brennan, an experienced bushman, set out to try and pick up the man's tracks.

He found them about four-miles from where the cutter had been working, and followed them for about 10 miles until they turned in the direction of the cutter's camp.

Mr. Brennan finally caught up with the cutter just as he reached the camp.

It was estimated that in the 10 hours he was lost, the cutter had walked between 20 and 25 miles.

During the day he had stumbled on a gnamma-hole which had held drinkable water.

Mr. Brennan said that the cutter had been lucky. It had been a mild day and the man was very fit. He was shaken but otherwise unharmed after his ordeal.

The area is densely covered with mulga and acacia, and there are no high points from which a lost person could take a sighting".

Yours etc,

P. Richmond

Hamel, W.A.

The Editor,  
"Forest Notes",  
PEMBERTON

Dear Sir,

Just a short note to submit an article for the next edition regarding supply of snail samples to:-

Mr. G. Kendrick,  
c/- W.A. Museum,  
James Street,  
PERTH. 6000

Evidently Mr. Kendrick is studying snail migration to and through the countryside and would be appreciative of any samples collected.

Details are given in the "W.A. Wildflower News" of May 1971. This study is considered of importance to this Department and the rural population in general as anyone who has had to contend with large populations will testify.

Yours etc.

A.J. Hart  
Silviculturalist  
(Nurseries.)



## GUIDE TO THE MEASUREMENT OF FOREST FUEL QUANTITY

by

R.J. Sneeuwjagt

### INTRODUCTION

When planning for prescribed burning and fire control operations it is essential to know the quantities of fuels present within the forest area. Litter quantities may often be estimated in the office from records of past burning and forest canopy cover. However litter quantities may have altered due to unforeseen factors such as insect infestation of tree crowns, trade cutting and incomplete burning.

Other forest fuel components such as forest understorey vegetation (called scrub) and trash fuels, made up of twigs and dead scrub, cannot be calculated in the office from maps or records.

The need for an objective field checking and fuel quantity assessment method has led to the development of rapid and reliable sampling techniques based on direct measurements of litter depth, trash height and scrub density and height.

The assessment techniques are designed to enable two assessors to cover an average size aerial-burning block (10,000 acres) in two to four days depending on the forest types of the area.

For pine plantations and other valuable, high risk areas, a system of mapping litter depths has been developed which provides a quantitative measure of risks from changes in fuel and provides a basis for deciding correct conditions for lighting.

These notes describe sampling and mapping techniques for ground and scrub fuels and provide an example of field sheets, fuel quantity tables and appropriate assessment aids.

## GUIDE FOR MEASURING FOREST FUEL QUANTITY

### A. AERIAL PRESCRIBED BURNS

#### I. Assessing Litter Quantity by Depthing

Litter depthing is conducted with a litter depth gauge which consists of a wooden slide between metal rails attached to a scaled stand. The instrument is used by inserting the slide into a small hole made in the litter bed, and reading off the depth on the rule. It is essential that the base does not rest on twigs, stones and other debris and that there is no disturbance or mounding of the surrounding litter.

A reliable depth estimate is obtained by taking twelve measurements in a line at ten-yard intervals.

Space is provided on the Fuel Assessment Sheet No. 1 (Appendix 4) to record these depths, and to calculate the totals and the mean depth.

Convert depth to weight (tons per acre) by referring to Table 1 and 2 (Appendix 1).

To ensure that the assessment line is in the correct fuel type and age, it is advisable to "walk in" another 5-10 chains from the line and inspect the surrounding area.

N.B. Locate line well in from edges of roads or compartments as these edge zones often receive different fire treatment to the internal areas.

#### II. Assessing Trash Quantity by Heighting

"Trash" is the term given to the Stick layer present in nearly all karri and mixed karri forests. The trash consists of dead branch and stem debris of trees and understorey shrubs.

A rough relationship exists between trash weight and top height, which is the general trash ceiling level,

and which excludes irregularities caused by the occasional tall, upright branch of dead scrub.

An average trash top height is determined from 24 height measurements per line, preferably one on either side of the 12 sites selected for depthing. The trash contains a large proportion of heavy sticks and scrub stems; sparse trash usually consists of lighter tree and scrub debris.

Convert to tons per acre by referring to Table 3 (Appendix 2). This table also includes the weights of the trash portion with a diameter less than  $\frac{1}{2}$  inch, which is the fraction burnt under normal prescribed burn conditions.

### III. Scrub Type and Quantity Assessment

Estimates of scrub weight are obtained by classifying the scrub into one of six recognized scrub structural types. These types are identified according to their density profiles and top heights. Each structural type may have a variety of dominant species types, but these must have a similar height-density profile in order to belong to that structural type. That is, scrub classification is based on structural rather than botanic differences.

Each type covers a range of cover densities rated as either sparse, medium or dense. Appendix 5 shows the six types in histogram form, and which, with practice, can be used to classify scrub by appearance only.

Before the assessor can utilize these histograms, it is necessary for him to conduct a small point-sampling trial each time he encounters a new scrub type. The trial requires twenty point-sample observations to be made in both the sparse and dense communities within the type. It is suggested that these be taken along a line at ten (10) feet intervals.

Point sampling is simply the recording of the number of contacts and the height at which the shrub foliage make with a tall (up to 13 ft.) thin, rod marked at one-foot intervals. The rod is carefully inserted vertically in

the scrub at each site. The scrub top height and the species type are also recorded on Field Sheet No. 2 at each site (See Appendix 4).

The number of contacts are totalled and an average value determined for each one-foot height interval. A density profile is drawn up for both scrub density extremes, and these are matched with one of the six standard types provided. Future classification may be done visually by reference to these density profile histograms.

Assessment of scrub is carried out simultaneously with litter and trash assessments. At each of the twelve (12) observation points on the line, the following scrub features must be recorded; structural type, density rating, average top height, dominant species and an estimate of the percentage of scrub dead or cured. Scrub fuel loadings are determined from Table 4 in Appendix 3. Added to this table is the list of weights of foliage below four (4) feet. This is the amount usually burnt in mild prescribed burns.

Because scrub inflammability varies with species, it is necessary to introduce an inflammability factor which is directly related to the foliage dimensions and the estimated percentage of dead foliage. Table 5 (Appendix 3) lists the multiplicative factors for the common scrub communities.

The following is an example of how to calculate scrub fuel loading.

Consider a Structural Type 5 of medium density and with an average top height of 14 ft., with nectic (*Bossia aquilifolium*) as a dominant species. Nectic is considered to be relatively highly inflammable.

If prescribing for an all-foliage consuming burn, then foliage weight (Table 4) = 2.0 tons per acre. If foliage is 20 per cent dead, then inflammability factor for a high scrub is 1.5

Therefore, scrub fuel loading =  $2.0 \times 1.5 = 3.0$  t.p.a.  
 For total scrub consuming burn, loading =  $7.0 \times 1.5 = 10.5$  t.p.a.



#### IV. Location of Plot Lines

A stratified random sampling is employed in locating plot lines within large aerial burns. The office procedure is as follows:

- (i) From past burning plans trace the areas of same age burns onto the A.P.I. map of the proposed area. Label with the year and season of last burn.
- (ii) Outline the major forest types within the areas of same burning age.
- (iii) Select the upper and lower extremes of tree canopy cover in each forest type within each burn.
- (iv) Randomly select sites for two sample lines within each canopy extreme for each forest type.

If there are more than three ages of burning or more than three major forest types, the number of sampling lines may be reduced to one line for each canopy extreme.

Locate the lines no closer than five chains from the edge of roads or compartments as these edge zones often receive different fire treatment to the internal areas.

- (v) From the fuel accumulation tables (Peet 1970), determine the litter quantity in tons per acre for each sample site. This calculated value is compared with the field estimate as a check of the information provided from burning plans and A.P.I. maps.
- (vi) The litter, trash and scrub fuel quantities at each site are added together, the values of which may be used to determine the range of expected fire behaviour within forest type and burning age classes. The prescriptions are then drafted indicating the number and sequence of lightings required to burn the area within acceptable fire intensity limits.

## B. VALUABLE, HIGH RISK STANDS

High risk areas such as pine plantations and young regrowth stands require more accurate assessment of fuels present within individual compartments. A fuel mapping technique was developed which provides a quantitative measure of risks from change in fuel.

### Pine Plantations

Litter depthing is conducted on a grid basis the spacing of which depends on uniformity of fuels. Most stands are measured on a 3 chain x 3 chain grid. Edges of compartments are measured more intensively, i.e. at  $1\frac{1}{2}$  chain spacing, because of the heavier fuel accumulation in these zones.

Mapping is done directly on the field sheet (Field Sheet No. 3) which is ruled into  $\frac{1}{2}$  inch x  $\frac{1}{2}$  inch squares. The field sheet is orientated to the planting line and the north-directing arrow marked in. Depths are recorded in each square commencing at the appropriate corner of the sheet.

Also recorded within each square is the scrub types present, their top heights, and estimated percentage ground cover. Space is also provided to record details about the stand, thinning and pruning history, and period since last burn.

In the office, the fuel contours at selected depth or fuel quantity intervals are shaded in and scrub areas marked in. Areas requiring attention are noted for possible exclusion or special treatment.

In thinned stands it is necessary to assess the needle fuel present on thinning tops. The method developed requires a butt girth measurement of 50 thinning crowns throughout the compartment. The mean girth value is read into Table 6 (Appendix 6) which gives the tonnage of needles and twigs per 100 tops. The number of tops present is equal to the number of trees thinned. The calculated weights of thinning tops are added to the weight of available litter fuel for burning prescription purposes.

## Hardwood Regrowth Stands

It is not necessary to assess fuel quantity within regrowth stands to the same degree as pine plantations. This plus the fact of limited access within these stands make it necessary to reduce sampling somewhat.

The overall area should be divided into convenient blocks of about 200 to 300 acres, bounded by roads. Measurements of litter depth, trash height and scrub type, height and density are conducted at ten-chain intervals one chain in along the perimeter. Two lines either parallel to, or bisecting each other are also taken through the heart of each block.

After litter, trash and scrub fuels have been converted to tons per acre, these can be mapped on A.P.I. base plans showing forest type and canopy. Topographic features such as ridges and gullies should be marked in as these help to define boundaries of scrub and forest types. From these well-defined zones become evident which give guidelines to the probable fire behaviour and the number and sequence of lightings required to burn the area within acceptable scorch and butt damage limits.

## Fuel Depth - Weight Table for Hardwood Forest Types

Litter Depth inches	Karri (K, KM, KMJ)	Jarrah (J, JM)	Marri near Karri (MK)	Marri near Jarrah (MJ)
	Tons per acre (O.D. Wt.)			
0.1	0.7	0.7	0.7	0.7
0.2	1.3	1.3	1.2	1.2
0.3	2.0	1.8	1.7	1.7
0.4	2.6	2.3	2.2	2.1
0.5	3.3	2.8	2.7	2.5
0.6	3.9	3.3	3.2	3.0
0.7	4.5	3.8	3.7	3.4
0.8	5.2	4.4	4.1	3.7
0.9	5.8	4.9	4.7	3.9
1.0	6.5	5.4	5.2	4.2
1.1	7.1	5.9	5.7	4.4
1.2	7.8	6.4	6.3	4.6
1.3	8.4	6.9	6.8	4.8
1.4	9.1	7.4	7.4	5.1
1.6	10.4	8.4	8.2	5.5
1.8	11.7	9.5	8.8	6.0
2.0	13.0	10.5	9.4	6.5
2.2	14.3	11.5	10.0	7.0
2.4	15.6	12.5	10.6	7.5
2.6	16.9	13.5	11.2	7.9
2.8	18.2	14.5	11.8	8.4
3.0	19.5	15.5	12.4	8.9
3.2	20.8			
3.4	22.1			
3.6	23.4			
3.8	24.7			
4.0	26.0			
4.5	29.3			
5.0	32.5			



## Fuel Depth -Weight Table for Needle Litter Types

Litter Depth Inches	Monterey Pine (P.radiata)	Maritime Pine (P.pinaster)	Karri-oak (Casuarina decussata)
	Tons per acre (O.D. Wt.)		
0.2	0.9	1.5	1.3
0.4	1.7	2.5	2.6
0.6	2.5	3.4	3.7
0.8	3.2	4.2	4.7
1.0	3.9	5.0	5.6
1.2	4.6	5.6	6.1
1.4	5.2	6.3	6.6
1.6	5.8	6.9	7.1
1.8	6.3	7.6	7.5
2.0	6.8	8.2	7.9
2.2	7.3	8.9	8.3
2.4	7.7	9.5	8.7
2.6	8.1	10.2	9.0
2.8	8.4	10.8	9.4
3.0	8.7	11.5	9.7
3.5	9.4	13.1	10.5
4.0	10.0	14.7	11.2
4.5		16.3	11.9
5.0		17.9	12.5
5.5		19.6	13.1
6.0		21.1	13.7

## Trash Weight Tables

Depth feet	Dense (heavy sticks)		Sparse (old dead scrub)	
	Total	Less than $\frac{1}{2}$ " diam. tons per acre	Total	Less than $\frac{1}{2}$ " diam.
0.5	3.8	2.2	2.4	1.0
1.0	7.5	4.4	4.7	2.1
1.5	11.3	6.7	7.1	3.1
2.0	15.0	9.1	9.5	4.2
2.5	18.8	11.3	11.8	5.2
3.0	22.5	13.6	14.2	6.3
3.5	26.3	15.8	16.0	7.3
4.0	30.0	18.0	18.0	8.4

Scrub Weight Tables

Scrub Structural Type	Ave. Top Ht. (Ft)	Total Live Scrub Wt. (t.p.a.)			Total Foliage Wt. (t.p.a.)			Foliage Wt. Below 4ft. (t.p.a.)		
		D	M	S	D	M	S	D	M	S
1	25	16.5	14.0	12.5	3.5	3.0	2.8	0.2	0.3	0.4
	20	14.0	12.5	10.5	3.2	2.8	2.5	0.2	0.3	0.4
	18	12.0	11.0	9.0	2.7	2.5	2.2	0.3	0.3	0.3
	16	9.0	8.0	7.0	2.1	2.0	1.8	0.3	0.3	0.3
2	25	19.5	17.0	15.5	3.8	3.5	3.2	1.2	1.0	0.6
	20	17.0	15.0	13.0	3.5	3.2	2.8	1.2	0.9	0.5
	18	15.0	13.5	11.5	3.2	2.8	2.5	1.2	0.8	0.5
	16	13.0	11.5	10.0	2.8	2.5	2.2	1.0	0.7	0.4
3	10	7.5	5.0	3.0	2.0	1.6	1.2	0.6	0.5	0.4
	8	5.5	3.5	2.2	1.6	1.2	1.0	0.6	0.5	0.4
	6	3.0	2.2	1.6	1.2	1.0	0.8	0.8	0.6	0.5
	4	2.0	1.5	0.8	1.0	0.8	0.5	1.0	0.8	0.5
4	18	12.5	10.0	8.0	3.5	2.8	2.2	0.6	0.5	0.5
	16	10.5	8.0	6.0	3.0	2.5	1.8	0.6	0.5	0.5
	14	9.0	6.5	4.0	2.5	2.0	1.5	0.5	0.4	0.4
	12	7.5	5.0	2.5	2.0	1.5	1.0	0.5	0.4	0.4
5	20	14.0	11.0	8.0	3.0	2.5	2.0	0.4	0.3	0.3
	16	11.0	8.5	6.5	2.8	2.2	1.8	0.4	0.3	0.3
	14	8.5	7.0	5.5	2.5	2.0	1.6	0.5	0.4	0.4
	12	7.0	5.5	4.5	2.2	1.8	1.4	0.6	0.5	0.4
	10	5.5	4.5	3.5	1.8	1.5	1.2	0.6	0.5	0.4
6	5	3.0	2.0	1.8	1.6	1.2	1.0	1.5	1.2	1.0
	4	2.2	1.8	1.5	1.4	1.0	0.8	1.4	1.0	0.8
	3	1.5	1.2	1.0	1.2	0.8	0.6	1.2	0.8	0.6
	2	1.0	0.8	0.6	0.8	0.6	0.5	0.8	0.6	0.5

## Scrub Inflammability Factors

Scrub Communities	Type Nos.	Young Green	Percentage Dead			Examples
			20	50	80+	
Heath (up to 4ft.) High inflammability Low inflammability Ti-tree types	6	1.0 0.2 0.5	1.5 1.0 1.5	3.0 2.0 3.0	5.0 3.0 5.0	Agonis parviceps
Medium Scrub (4-12 ft.) High inflammability Low inflammability	3,5	0.3 0.1	1.5 1.0	2.5 1.5	4.0 2.0	Prickly Moses, Netic Karri wattle.
High Scrub (12-25 ft.) High inflammability Low inflammability	1,2, 5	0.5 0.1	1.5 0.5	3.0 1.0	4.0 2.0	Casuarinas Hazel
Grasses High Inflamm. Low Inflamm.	6	1.0 0.1	2.0 0.5	3.0 1.0	4.0 2.0	Kero Grass Rushes

Multiply Scrub Weight (Table 4) by Inflammability Factor to determine Scrub Fuel Loading.



APPENDIX 4

7 (f)

FUEL ASSESSMENT SHEET NO. 1

AREA LOCATION ..... DATE.....  
 LINE NO..... FOREST TYPE .....  
 AV. TREE HT. (FT)..... CANOPY COVER .....%  
 YEAR OF LAST BURN..... SEASON.....  
 MAJOR SCRUB SPECIES.....

OBSERV. NO.	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL	AVER.
Litter Depth (ins)														
Trash Ht. (FT.)														
Scrub No.														
Density														
Top Height														
% Foliage Dead														

Litter Wt. (K, M or J) = T.P.A.      Trash Wt. = T.P.A.  
 Total Live Scrub Wt. = T.P.A.      Foliar Wt. = T.P.A.  
 Wt. of Foliage Below 4 ft. = T.P.A.      Grass Dens. =

LINE NO..... FOREST TYPE.....  
 AV. TREE HT. (FT)..... CANOPY COVER.....%  
 YEAR OF LAST BURN..... SEASON.....  
 MAJOR SCRUB SPECIES.....

OBSERVE. NO.	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL	AVER.
Litter Depth (ins)														
Trash Ht. (FT.)														
Scrub No.														
Density														
Top Height														
% Foliage Dead														

Litter Wt. (K, M or J) = T.P.A.      Trash Wt. = T.P.A.  
 Total Live Scrub Wt. = T.P.A.      Foliar Wt. = T.P.A.  
 Wt. of Foliage Below 4 ft. = T.P.A.      Grass Dens. =

SCRUB POINT SAMPLING

LOCATION:

DATE:

HEIGHT INTERVALS

NO. OF RODS	0	1	2	3	4	5	6	7	8	9	10	11	12	14	SCRUB TYPES
	to 1	to 2	to 3	to 4	to 5	to 6	to 7	to 8	to 9	to 10	to 11	to 12	to 14	+	
1															
2															
3															
4															
5															
6															
7															
8															
9															
10															
11															
12															
13															
14															
15															
16															
17															
18															
19															
20															
<b>TOTALS</b>															
<b>AVERAGE</b>															

**DOMINANT SCRUB TYPES:**

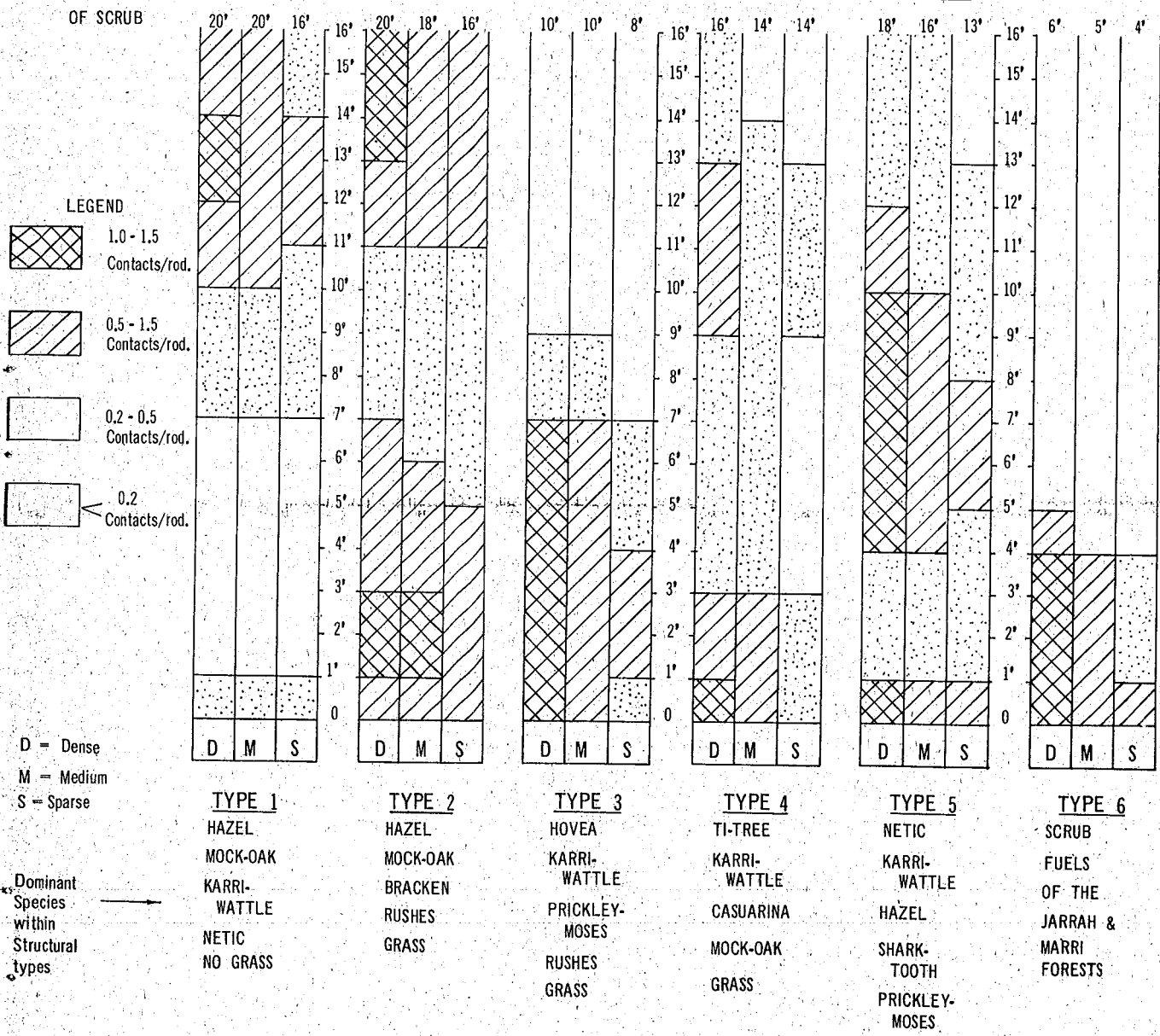
**STRUCTURAL TYPE:**

APPENDIX 5

AV. TOP HEIGHT  
OF SCRUB

SCRUB DENSITY PROFILES OF SIX COMMON STRUCTURAL TYPES

7 (h)



P. pinaster Thinning Crown Weights in Tons per acre (O.D. Wt.)  
per 100 tops

Crown Butt Girth ins.	Foliage Weight T.P.A.	Twigs Weight T.P.A.	Crown Butt Girth	Foliage Weight T.P.A.	Twigs Weight T.P.A.
6.0	.17	.04	13.5	.95	.23
6.5	.22	.05	14.0	1.00	.24
7.0	.27	.07	14.5	1.07	.26
7.5	.32	.08	15.0	1.11	.27
8.0	.38	.09	15.5	1.16	.28
8.5	.43	.10	16.0	1.21	.29
9.0	.48	.11	16.5	1.27	.30
9.5	.53	.13	17.0	1.31	.31
10.0	.59	.14	17.5	1.37	.33
10.5	.63	.15	18.0	1.42	.34
11.0	.69	.17	18.5	1.47	.36
11.5	.74	.18	19.0	1.53	.37
12.0	.79	.19	19.5	1.58	.38
12.5	.85	.20	10.0	1.63	.39
13.0	.90	.21	20.5	1.68	.40

Enter Table 3 with mean butt girth of thinning crowns (from 50 measurements) and read off Foliage and Twigs weight in T.P.A per 100 tops. To derive at total tons per acre multiply the table value by the number of trees thinned per acre, divided by 100.

APPENDIX 6

PINE FUEL DATA SHEET No.3.

7 (j)

Date: 6/9/71 Location: Ludlow Compt. 48 Date Planted: 1936 Spacing: 8 x 6

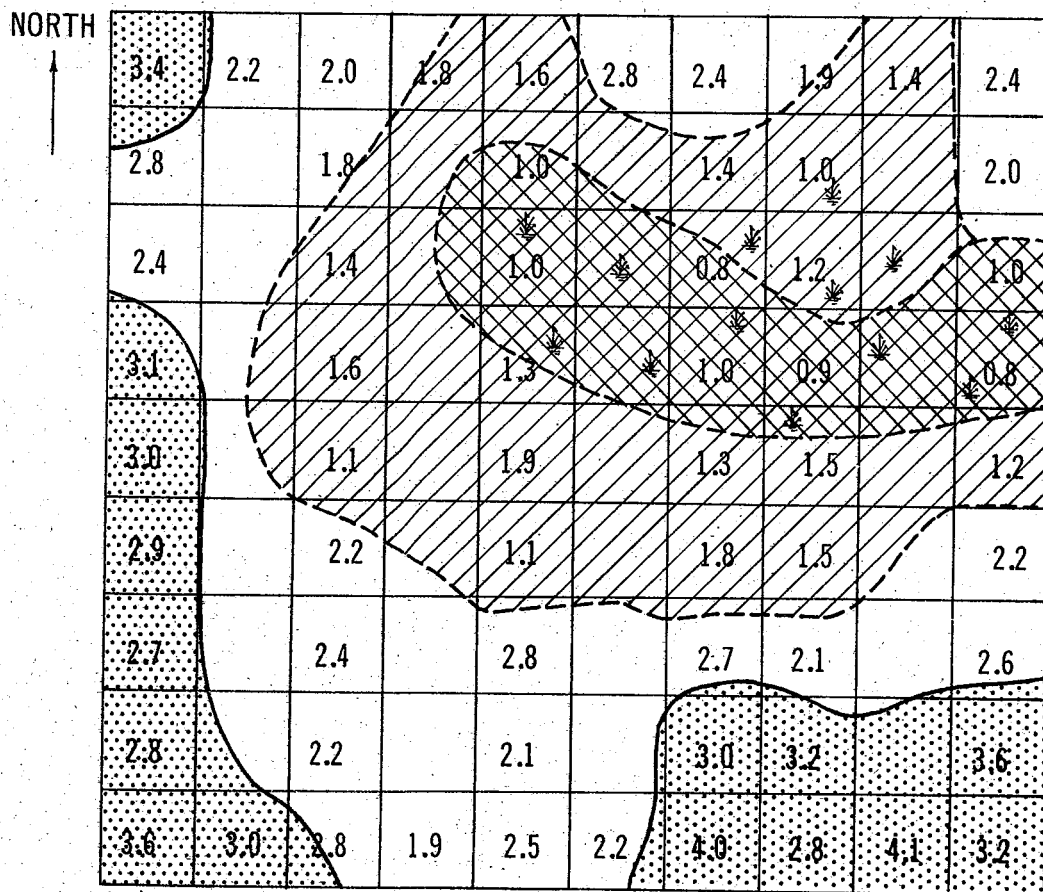
Fuel Type: Needles pruned: yes tops: No Co-dom height: 45'

Stocking: 450 Green crown height: 25' Scrub type: Hib. hypericoides Height: 2' - 3'

Density: Med. Slope: 2° Aspect: North Area: 18 ac.

Date thinned: 1950 Date previously burned: 1968 Type of burn: edge only

Scale: 1" = 3 chain



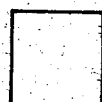
LEGEND



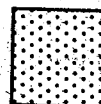
1.0"



1.0" to 2.0"



2.0" to 3.0"



3.0"



Swamp

## A RUM DO

by

L. Talbot

The tradition among timber workers of the South West of having a keg at the mill before knocking off for their Christmas holidays, probably dates back to the earliest days of timber milling in Western Australia, but it is doubtful that the present day jarrah jerkers have the alcoholic capacity to match the tough old hands at the original mill keg party.

This historic "Keg Do" was held at Quindalup near Busselton in 1854 at Mr. Henry Yelvertons Mill, the first to be built in Western Australia. Soon after the mill was built, the Governor and Under Secretary rode down 150 miles from Perth to see it. To celebrate the occasion, the Governor shouted the men a cask of rum, the mill owner did the same.

As this gift totalled 52 gallons of rum and as the mill employed 47 men all told, it seems reasonable to assume that production slackened off the next day.



by

F. Batini

'....There are the hills,  
Too; gardens gone under the  
scum of the forests.....'

In today's world, where words such as ecology, pollution, conservation and bio-degradable have permeated society; and where the value of forests has become more widely recognised, it may be expected that this quote has been taken from a violently partisan, anti-conservation publication. In fact, it has been drawn from an excellently prepared pamphlet entitled "Forestry: Time to Rethink" produced by the Rambler's Association of Great Britain. This Association is vitally interested in the aesthetic and amenity aspects of the British countryside and has been recently involved in a number of important conflicts of interest within the U.K. It has now turned its attentions to the practice of forestry and to the operations of the British Forestry Commission and of private bodies in this field.

The Ramblers is not the only body concerned at the recent trends of British forestry. The Forestry Action Group from Wales has also produced a number of pamphlets which attack current B.F.C. practices. Criticism has appeared frequently in the national press and on television. In the scientific journals, university professors and others have voiced a desire for a change. Some have even forecast the "End of Forestry in Great Britain", in the traditional sense.

Why then this criticism and public scrutiny? The B.F.C. appears to be performing a useful function in the U.K. Founded in 1919 as a direct result of the savages to Britain's forests during World War I, it is now the largest single landowner in the U.K. (2,800,000 acres). Privately owned woodland totals a further 1,700,000 acres. Through its acquisition of marginal farm land in Scotland and Wales, an annual planting rate of between 45,000 and 50,000 acres is possible. Financial assistance is available to private landowners and some 36,000 acres were planted by private organisations during the 1969-1970 fiscal year. A national

target of some 5,000,000 acres of fully productive woodland by the year 2000 A.D. is called for. These programmes provide employment sorely needed in the economically depressed regions of Scotland and Wales. The encouragement of both the public and the private sectors finds support in both the Labor and Conservative lobbies of Whitehall. The historical stance of the B.F.C. on the issue of conservation is good. It created the first national parks in the U.K. and has since supplemented these with its own forest parks. More than 15,000,000 visits to forest areas were made during last year and over 800,000 camper-nights were spent in the specially constructed camping and caravan sites. Though vehicle travel is excluded in most forests, a considerable number of walking trails, picnic and rest areas are provided. This applies particularly to the more accessible forests close to the larger centres of population. A well-known landscape architect assists with the design of plantation layout so as to minimise any visual offence to the traveller. Other practices designed to increase the amenity value and beauty of the Commission's land are also carried out. Various pamphlets depicting the advantageous aspects of forestry are produced by an apparently efficient public relations branch.

Yet the tide of criticism continues. Opponents of the present practices resent the alteration to the moor and mountain landscapes caused by large-scale afforestation programmes (the bulk of present plantings are located in areas of great scenic beauty). Another criticism is the current change from the traditional and very beautiful mixed hardwood stands of oak, beech, birch and ash, to monotonous plantations of exotic spruces. But the critics do not argue solely on aesthetic grounds. They appreciate that these are largely "value" judgements and their attack is far better and more reasoned.

In view of developments in the technology of war, they argue that the strategic reserves concept of British Forestry is no longer valid. Admittedly, growing timber in the U.K. does reduce the very large import bill (currently £650,000,000/year), but is it sensible to place considerable public moneys into a high cost, low return home industry when timber can be imported just as cheaply from overseas? Certainly the cost to the British taxpayer is high (about £40,000,000 per year in direct and indirect costs) and the returns are low (3 to 5 per cent) which is far less than the current rates of interest charged on these loans. Severe doubts are also cast on the predicted world timber shortage and the opinions of eminent foresters are used to back up these arguments. Although it is recognised that Forestry does provide some employment opportunity in rural area, its

contribution to reducing the depopulation problem is not considered to be significant. The Commission states that, since 1960, its labour costs have risen by 80 per cent. To compensate, the average production per man has risen by 90 per cent in the same period. The industry is becoming more capital intensive and though the area planted annually is increasing, Commission staff has in fact been deliberately reduced by 23 per cent in the past 3½ years.

On the recreation and amenity aspects, the critics argue that the provision of recreation is necessarily a secondary task for the B.F.C. and, as such, it suffers dearly from a lack of financial support and is given only luke-warm backing from top management. The dense, dark, coniferous plantations give little joy to the recreating public and provide an unnatural environment for the native fauna and flora. The B.F.C.'s management of hardwood stands in amenity areas is cited as a tacit admission that conifers are alien and unsightly in outstanding landscapes. Thus, large areas of land are considered to be irretrievably lost to the recreating British public. It is also considered that the anticipated silvicultural regimes involving greater mechanisation, denser crops, shorter rotations and more extensive clear fillings would make nonsense of the industry's amenity and recreational proposals. These arguments have even greater relevance when one considers the private forestry sector.

In broad, the critics are calling for an independent enquiry into the management objectives of the B.F.C. and a cost-benefit study of the forest enterprise. They demand a decrease in the commercial aspects of forestry and an expansion of its recreational and aesthetic facets. Serious doubts are cast as to whether the B.F.C. is the most qualified body to manage the social benefits which forests provide. These criticisms are made by organisations and individuals vitally interested in the conservation of the pleasant British countryside. The anti-forestry campaign is achieving quite an impact. A B.F.C.'s pamphlet admits this: "In England and to a lesser extent in Wales, the development of forestry is seriously inhibited by organised amenity interests".

Are there any lessons in this for forestry in Western Australia? Admittedly, some of the arguments presented are of local interest only, but others have distinct relevance to the situation in Western Australia today. The landholdings of the Forests Department in the more populated southwest land region would most likely exceed 20 per cent of the available area. Forestry is in public view and there has been, and will continue to be, pressure to put this land to

alternative uses. Over large sections of State Forests, the economic return from timber production is very low. Over considerable areas, the economic worth of this land for products other than timber (particularly water, minerals and recreation) greatly exceeds either current or potential timber yields. Pressure groups equivalent to the Rambler's Association exist in our State. To date, the conservation lobby has been mostly on "our side", but the evidence from the U.K., the U.S.A. and the Eastern States suggests that this need not be so in the future. In fact, some of these bodies could be said to have definite vested interests in the forest area and, like the Ramblers, could be expected to receive a "spin-off" if the current forestry practices are altered. Admittedly, forests do provide considerable social benefits and foresters have used these as evidence that this land should remain under their control. How much do we really know of the effects of current forest practice on water yield, salting, recreational opportunity, flora and fauna? Have foresters really proved themselves to be the most qualified body to manage forests for the social benefits which they provide?

RED TINGLE (*EUCALYPTUS JACKSONI*) AS A HEAVY STRUCTURAL TIMBER

by T.J. Maher

Near the south coast an extensive area of red tingle forest occurs. It is roughly defined by the Bow, Frankland and Deep Rivers. It can occur as a pure stand but is usually closely associated with karri. In mixed stands tingle usually predominates. It is usually larger in girth than karri, though not as tall.

The majority of the area is prime forest and there are phenomenal pole and pile regrowth stands. The current commercial value is nil, although the potential is high. At the moment trials of red tingle poles are being considered and the potential for the species for peeling will be assessed in the next few months.

Recently, the bridge over the Frankland River at Nornalup was strengthened. It was of interest to find that the major structure and piles of the existing bridge were red tingle. The piles were drive in 1921, having been cut from Group Settlement areas nearby. Initially the bridge had a raised section in the centre to allow for the masts of passing boats. In 1937 the bridge was severely damaged by fire and when restored some of the piles were spliced with jarrah and the stringers replaced. The decking was red tingle. When this tingle decking was pulled up in 1971 it was found to be in good condition. The red tingle piles were also quite good.

Points of interest regarding this bridge:

1. Span: 190'
2. Normal life of a jarrah pile: 20-30 years.
3. Red tingle piles currently in use for 51 years.
4. The piles are 55' long, 35' driven, 8' in water and 12' to the stringers.
5. The area is under tidal influence.

## REGENERATION OF TUART

by

D.J. Keene and E.M. Cracknell

The bulk of the Tuart forest at Ludlow forms State Forest No. 1 and 2, and has been dedicated for over 50 years. During this time, efforts to foster the establishment of Tuart regeneration, have met with little success.

Quoting from "Forestry in W.A."

"The establishment of seedlings is an haphazard process of which the story is only partly known. Very little regeneration is found in the Tuart forest and has not been apparent for many years.

Seedlings generally die before they reach any appreciable size, and those that survive do so on an ashbed where a heavy pile of debris or a log has been burnt.

With this background, thought was given to the problems of achieving Tuart regeneration. These could be listed as follows:

1. Seed supply
2. Damage from stock in the forest
3. The effect and necessity of ashbeds
4. Competition for moisture and light from
  - a) Peppermint understorey
  - b) Existing Tuart forest
  - c) Native and introduced grasses
5. The effect of fire in achieving regeneration
6. Attacks from insects subsequent to germination
7. The possibility of using artificial means of regeneration

Each of these is discussed in turn:

### 1. SEED SUPPLY

A general seed year does not occur often and is difficult to predict. Between every fifth and eighth year has been suggested as usual. In the current attempts, an area

was selected that appeared to have sufficient matured capsules containing seed using an ocular estimate. More research into estimating the quantity of seed required to achieve regeneration, appears warranted.

## 2. DAMAGE FROM STOCK

For many years, grazing leases have been auctioned over the Tuart forest to reduce the fire hazard from native grasses. It was felt that any Tuart seedlings which did germinate, were damaged by stock. This was then proved in an area burnt in 1970. Cattle were excluded from the current trial.

## 3. EFFECT OF ASHBEDS

Communication with officers conversant with Tuart, indicated that the presence of an ashbed was essential to successful germination. Observations in the karri forest indicate that ashbeds are of great benefit, but not necessarily essential. To achieve the best possible ashbed, all peppermint understorey was pushed down and left broadcast over the area. Tops and other falling debris from Tuart milling operations also was available for burning. The beneficial effect of an ashbed, apart from one of fertilizing, was considered as an aid to eliminate competition from grass and insects.

## 4. COMPETITION FROM COMPETING SPECIES

- a) Earlier attempts at regeneration recorded that germination achieved, did not persist. It was felt that the dense peppermint understorey and remaining Tuart standards created light conditions incompatible with development of the regeneration. Open forest conditions were aimed at.
- b) Peppermint regeneration is most prolific after fire in autumn, and to minimize later competition between Tuart and peppermint seedlings, care was taken to push the peppermint while it was flowering to reduce the possibility of mature seed being available in autumn.
- c) It was also planned to fall the mature Tuart overstorey once regeneration was established to aid in allowing light to the developing seedlings.



- d) Experience with pine planting on the limestone based Wonnerup sands showed that there is extreme competition for moisture in late spring to the extent that many pines died from drought. The curing of native and introduced grasses remove most water from the profile. It was felt that this could be a reason for the lack of success away from ashbeds.

The use of Vorox A.A. sprayed over young pines and tuart open rooted stock, has proved effective. Further work to test the susceptibility of wildlings to Vorox, is needed, together with the optimum time and rate of spraying.

## 5. THE EFFECT OF FIRE

The use of fire as an aid to achieve a desirable seed bed and in opening all mature seed vessels at one time, is well known.

The test area of 35 acres was burnt with a fire of only moderate intensity on 19.5.1971 (an incomplete scorch of the mature Tuart stand resulted).

An inspection in July 1971, showed very little regeneration, those which had germinated were about 2" high.

A further inspection in November 1971, showed a prolific germination over most of the area, particularly on ashbeds. However, regeneration of smaller height was also achieved away from ashbeds. An average height of 8" was noticed. In January 1971, the seedlings on ashbeds had reached 12-15" (maximum 24"). Off the ashbeds, many seedlings had perished while the rest were unthrifty and up to 4" high. Grass competition was intense.

Theorising, it is felt that spraying of grass during early winter months, will assist.

## 6. INSECT ATTACK

Generally, the Tuart forest has been completely protected from fire over a very long period. This could be one of the reasons for a build up of a large population of insects capable of attacking Tuart. It was noted that seedlings produced in 1970 trials, subsequently were severely attacked by insects and became malformed. It was also noted that grasshoppers will attack and kill young karri seedlings in the Margaret River nursery. Grasshoppers exist in large

numbers in the Tuart forest.

The area was sprayed with a 0.6% solution of dieldrin in water using a conomist. To date, no insect damage is apparent apart from inaccessible areas missed with the spray.

Leaf curling is apparent here.

#### 7. PLANTING OF NURSERY RAISED STOCK

Some success has been achieved in the past with planting Tuart in plantation type conditions using jiffy potted stocks. However, this method of raising plants would be most expensive if large scale planting was to be undertaken.

In association with the Nannup nursery, trials to raise open rooted seedlings were instituted in 1970. Various methods of root pruning and topping were tried. The seedlings were planted in 1970, and a satisfactory survival rate achieved, particularly with root pruned and topped plants.

#### CONCLUSION

Once the seedlings produced have survived the first summer period, it would appear that success in establishment could be claimed. To date, they have survived a very dry period in which only 115 points have been recorded since October 1970 (80 points fell in the first half of November).

It is the writers' conclusion that much of the Tuart forest is understocked with Tuart. Two methods of obtaining regeneration have been tested, and from initial results, it appears that either is capable of producing satisfactory results.

TENDING SECOND GROWTH KARRI :  
LEFROY BROOK REGENERATION 1875

by

O.W. Loneragan

That late thinning is better than no thinning (e.g. Jarrah Pole Thinning) and early treatment is better than a late one (e.g. Pine Silviculture 1970) are communications that should pass through all levels of management into the field. The present writer finds the evidence on the karri growth rates confirms that of the other species (above). The data in the 1971 measurements and report, shows the actual rate percents are very low (Harvey, For. Notes 9(3): 24-27) 43 years after thinning, but demonstrates the increase due to late thinning (7B) ranges from 18-36 percent consistently better than the unthinned (7A) solving  $\frac{7B-7A}{7A} 100 (\%)$ . Also the standing volumes of the

16 largest trees 5 050c.ft in the thinned plot and 4 150c.ft in the unthinned (W.A.F.D. Ann. Rep. 1967: 31-32) demonstrated a response of 22 percent greater saleable volume in the thinned stand 40 years after thinning. This increase in value must not be ignored and confirms the purpose of thinning by putting more saleable growth on the crop trees.

The evidence on basal area increments for treatments in these stands is important to the present writer. It is inconceivable that early treatments in the second growth stands could not double the saleable growth in the basal area increments from about 1.6 to over 3.0 sq.ft/ac/an. The present growth has been obtained in the presence of weeds and dominated trees. In other words, the degree of stagnation of saleable growth becomes worse the longer thinning is delayed due to the continually increasing competition: hence the need for early and frequent thinning to maximise production.

The question of frequency of thinning also may be examined on the evidence of the diminishing value of the growth rates: certainly not later than when the rates in the thinned stands again equal those in the unthinned stands:

the available information extrapolated from the Big Brook data, suggests this point may be approached about 10 years after thinning to 80 crop trees

20	"	"	"	"	60	"	"
30	"	"	"	"	40	"	"

Response to these treatments at the age of 25 years in these plots was very high in the first 5 years; but at 10 years growth rates for all treatments were less than four percent at the age of 35 years. Weeds and dominated trees again were present.

Observers agree that the condition of the late-thinned and untreated stands become virtually the same: "it is apparent --- that the stand is greatly overstocked" (Meachem, 1954: Second Growth Karri Forest mss) and Harvey (1971 p.p.) proposes that the next thinning in 1972 is well overdue.

In the design of experiments for tending regeneration, a number of hypotheses can be and have been proposed. The experimental trees for example should be accompanied by an adequate number of instruments, when it is required to establish quantitative relationships for the treatments. Each factor of the environment assumes greater importance at limiting intensities, and a different optimum range comes into existence for all factors with every change, in one effective factor. The value of measurements of important environmental factors has been very well demonstrated (W.A.F.D. Annual Reports, 1967: 26-28; 1971: 26-29; Havel, J.J.).

Limitations in the value of observations made in the absence of instruments to measure habitat factors are demonstrated in the attached report on litter accession in some eucalypt stands.

## LITTER ACCESSION IN SOME W.A. EUCALYPT STANDS

by

O.W. Loneragan

The annual increase of dry substance of the eucalypts in seven pure stands of four species, *E. diversicolor*, *E. marginata*, *E. wandoo*, and *E. astringens*, is proportional to the annual rainfall in the range from 60 to 20 inches (Figure A). The leaf surface is shown to be in harmony with the rainfall; and the ultimate stand height, bole volume and total litter weights are graded similarly and closely parallel one another. Therefore the mature height of the co-dominant trees may be taken as a main indicator of site productivity.

Using a base of 100 for karri, the productivity of species by total leaf surface and bole material per unit stand area, ranks as follows -

<u>Stand</u>	<u>Leaf Surface/Mass</u> (%)	<u>Bole Material</u> (Mass %)
Karri	100	100
Jarrah	60/90	50
Wandoo	70	15
Mallet	30/50	10

The bole material decreases as the square of the rainfall, within broad limits approximately 60-20 ins. This is four times as rapidly as the decrease in leaf-surface or litter-mass; and indicates, with increasingly drier habitat, how inefficient the tree habit may become. Eventually the eucalypt tree is replaced by mallee in the arid regions. Conversely the efficiency of tree growth increases in freely-drained wetter regions.

Of interest here also are the relationships between periodic climatic factors and periodic behaviour of karri. An expected inverse relationship between sunshine and rainfall is recorded at Manjimup (Table 1). Of interest to Pemberton readers is the positive relationship however,

between sunshine at Manjimup and rainfall at Pemberton, indicating wet conditions in the karri forest at Pemberton during some fine weather at Manjimup, 15 miles north at the fringe of the karri forest.

The relationship between leaf fall and rainfall is observed to be reversed for the young and old growth stands near Pemberton (also Table 1). Only nine trees per acre have established in the virgin stand. These respond to the rainfall as expected, shedding of old leaves is high in the wet years and this is associated positively with flush growth. A negative trend could indicate a suppressed or locked condition in crowded stands. This is shown in the 85 year old stand with 50-80 stems per acre and 0.87 canopy. Leaf fall is high in the dry years, indicating stress conditions in the stand. This then should be relieved by thinning.

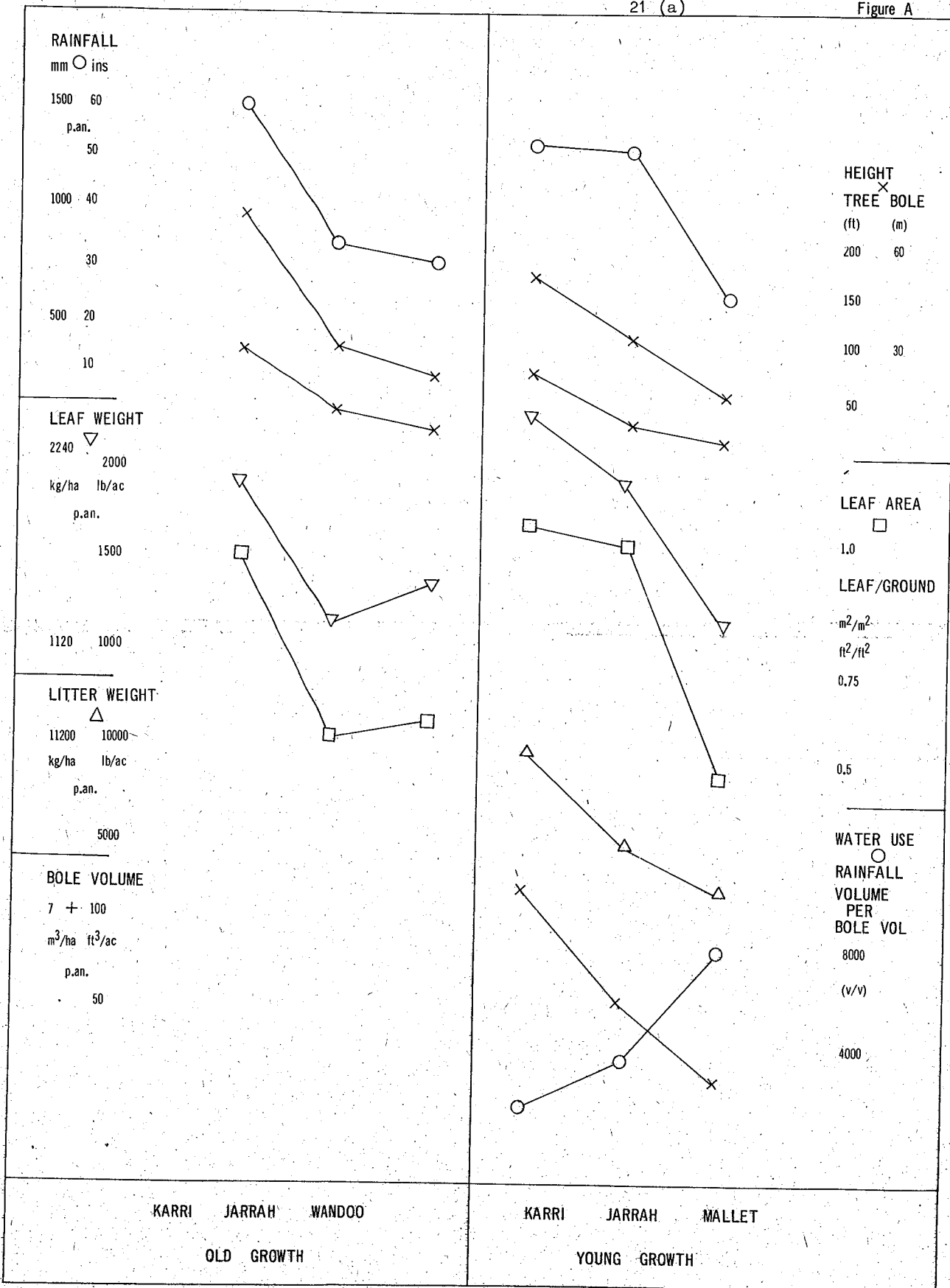




TABLE 1

LEAF FALL IN YOUNG AND OLD GROWTH KARRI STANDS, RAINFALL IN CENTRAL AND FRINGE KARRI CLIMATIC STATIONS, AND SUNSHINE ANNUALLY (APRIL-MARCH) IN RELATION TO 1959-60

Period 1956-64	Leaf	Fall	Rainfall	Sunshine
Localities of stands and stations	Warren N.P. Old	Lefroy Bk. Young (85 yrs)	Pemberton Central	Manjimup Fringe
Mean (8 years)	1850	2190	4830	2320
* 1959-60 (base)	1213	1853	3904	2220
(lb / ac).				
(Points)				
RELATIVE TO 1959-60 BASE VALUES*				
Apr. 1956-Mar 1957	188	145	131	115
1957-8	189	110	135	111
1958-9	149	152	122	104
* 1959-60	100	100	100	100
1960-1	123	127	110	111
1961-2	191	112	120	121
1962-3	167	102	138	129
1963-4	114	96	135	132
Mean (1956-64)	153	118	124	115
				105

## SAFETY NEWSLETTER

At the end of the six months period July 1971-December 1971 Twenty four (24) disabling injury accidents occurred as compared with thirty (30) during the corresponding period last year.

This reduction of accidents has resulted in a further drop in our frequency rate from twenty six (26) to an all time low of twenty four (24).

Although this reduction of accidents has only resulted in a drop in our F.R. of two (2) points (due to a considerable drop in the total manhours worked) satisfaction can be derived from the knowledge that six (6) less people have lost time due to a work caused injury during this period than did so during the corresponding period last year.

A number of divisions are still maintaining excellent safety records and must be congratulated for their contribution to the success of the overall safety programme.

The divisional safety figures for the period under review clearly reveals the areas where success has been achieved, improved upon, or maintained and also those areas where renewed efforts are required if we are to maintain our present excellent safety record.

Special mention must be made of the high level of safety performance being maintained by Collie division. Collie it will be remembered was the second division to achieve 100 000 accident free manhours, and at present having worked an accident free period of thirteen (13) months have a total of 112 000 manhours free of accident to their credit.

The present goal of this division is to better the existing departmental safety record of 250 000 accident free manhours set by Harvey and it is confidently expected that this will be achieved.

Since our last Safety Newsletter yet another employee has been saved from serious if not fatal head injuries by the use of protective equipment. Jack Driver of Grimwade was struck by a limb whilst felling a jarrah tree. The impact was sufficient to split Jack's helmet and knock him to the ground - Nett results: Headache, bruising and generally shaken up. Without the helmet it is obvious what

the result could have been. This is just another of the numerous examples that can be quoted of the value of wearing protective equipment to guard people from environmental hazards that cannot be eliminated.

Jack is now the fourth employee in this Department enrolled in the "Turtle Club" and will be presented with his helmet and badge in due course.

Our accident experience over the past four and half (4½) years proves conclusively that the wearing of the various items of protective equipment which are made available has prevented numerous injuries.

Yet it is disappointing to record that accidents are still occurring due to the failure of the injured person to avail himself of these items when necessary.

We are all agreed that not one of us likes to be hurt, yet there are still those of us who continue to unnecessarily expose ourselves to hazards - a practice which for sure will sooner or later result in an injury accident.

It is sincerely hoped that those people who are still of the opinion that "It Cannot Happen to Me" and choose to disregard common-sense safe working methods will change this attitude to that of the safe worker who does everything possible to keep himself and his workmates free from accident.

Remember! Safety is no accident.

Our own experience has proved that accidents do not "Just Happen". They are caused and can be prevented.

Since the implementation of the accident prevention programme in 1967 it is interesting to find that our present total accident experience parallels that of industry in general regarding the ratio of serious and disabling injury accidents.

This ratio is found to be 3-1. - That is for each disabling injury accident there are three (3) serious injury accidents. (A serious injury accident being one which necessitates medical attention only and not resulting in time loss).

Prior to 1967 this ratio was considerably higher in our department but has steadily declined to less than 3-1.

The divisional summary of D.I.A. v S.I.A. reveals where control of all accidents is gradually being achieved.

This gradual reduction of all injury accidents indicates that we are now well on the way to establishing a safety record in Forestry operations of which every employee should be justly proud.

However let us not be lulled into thinking that we have the problem licked - It is never licked, and calls for the highest degree of safety awareness by every one of us to reduce and maintain our accident rate at the lowest possible level.

Granted - our record proves that we have given the accident problem a fairly hefty nudge, but let's continue to nudge it, and so reap the many benefits that accrue from accident free experience.

DIVISION

D.I.A. 1970 - 1971

D.I.A. 1971 - 1972

	JULY	AUG	SPT	OCT	NOV	DEC	TOT	JULY	AUG	SPT	OCT	NOV	DEC	TOT	CURRENT ACCIDENT FREE MONTHS
COLLIE	-	-	1	-	1	-	2	-	-	-	-	-	-	NIL	13
KIRUP	1	1	1	-	-	-	2	-	-	-	-	-	-	NIL	8
WALPOLE	-	-	1	1	-	-	2	-	-	-	-	-	-	NIL	6
BUSSELTON	-	-	1	-	-	1	2	-	-	-	-	-	-	NIL	6
RESEARCH	-	-	-	1	-	-	1	-	-	-	-	-	-	NIL	14
W/PLANS	-	-	-	1	2	-	3	-	-	-	-	-	-	NIL	9
NARROGIN	-	-	-	-	-	-	NIL	-	-	-	-	-	-	NIL	18
KALGOORLIE	-	-	-	-	-	-	NIL	-	-	-	-	-	-	NIL	37
DWELLINGUP	-	-	-	-	-	-	NIL	1	-	-	-	1	-	2	1
HARVEY	-	-	-	-	2	-	2	1	-	-	-	-	-	1	5
PEMBERTON	1	-	-	-	1	-	2	1	-	-	-	-	-	1	5
KELMSCOTT	-	-	-	-	1	-	1	-	1	-	-	-	-	1	4
TRAINEES	-	-	-	-	-	-	NIL	-	-	-	-	1	-	1	1
NANNUP	-	-	-	-	-	-	NIL	-	-	1	-	1	-	3	-
MANJIMUP	-	1	-	-	1	1	3	1	-	1	-	-	-	2	3
COLLIER- SOMERVILLE	-	-	-	-	1	-	1	-	1	-	-	-	2	3	-
MUNDARING	1	-	-	1	2	-	4	1	-	-	2	1	-	4	1
WANNEROO	-	-	1	-	1	2	4	1	2	1	1	1	-	6	1
<b>3</b>	<b>2</b>	<b>5</b>	<b>4</b>	<b>4</b>	<b>12</b>	<b>4</b>	<b>30</b>	<b>6</b>	<b>4</b>	<b>3</b>	<b>3</b>	<b>5</b>	<b>3</b>	<b>24</b>	

MANHOURS WORKED = 922,718  
F.R. = 32.5

MANHOURS WORKED = 852,140  
F.R. = 28.1

CURRENT DEPARTMENTAL F.R. CALCULATED ON ACCUMULATED M.H.W. = 24

## DEPARTMENTAL ALL INJURY STATISTICS

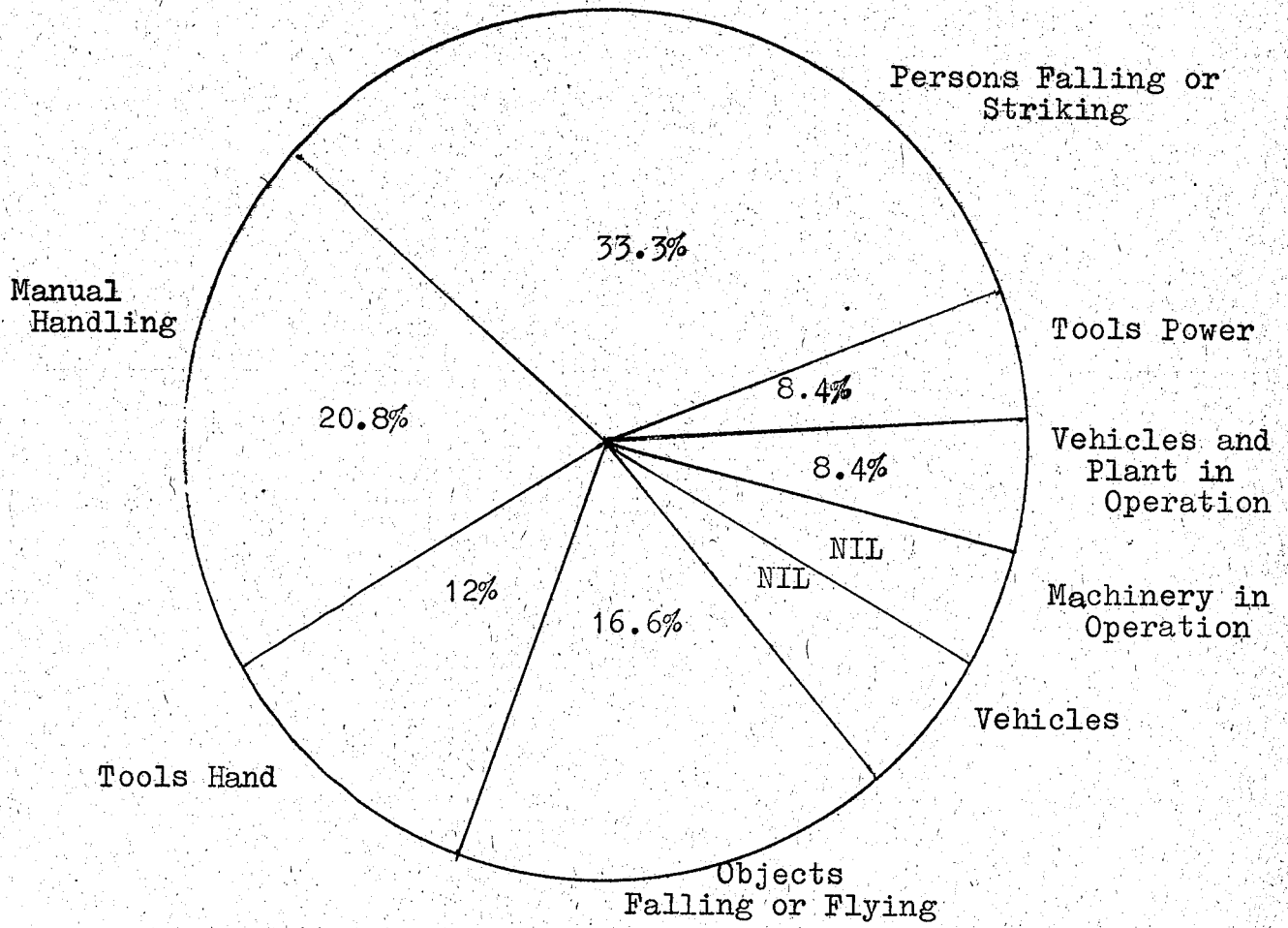
	D.I.A.	S.I.A.
KALGOORLIE	NIL	NIL
W/PLANS	NIL	NIL
RESEARCH	NIL	NIL
TRAINEES	1	NIL
D'ELLINGUP	2	1
NARROGIN	NIL	1
KELMSCOTT	1	1
WALPOLE	NIL	1
COLLIER -SOMERVILLE	3	2
PEMBERTON	1	3
MANJIMUP	2	3
MUNDARING	4	4
NANNUP	3	5
WANNEROO	6	5
COLLIE	NIL	5
BUSSELTON	NIL	7
KIRUP	NIL	10
HARVEY	1	18
	24	66

TOTAL INJURY ACCIDENTS = 90

$\frac{90 \times 1,000,000}{852,140}$

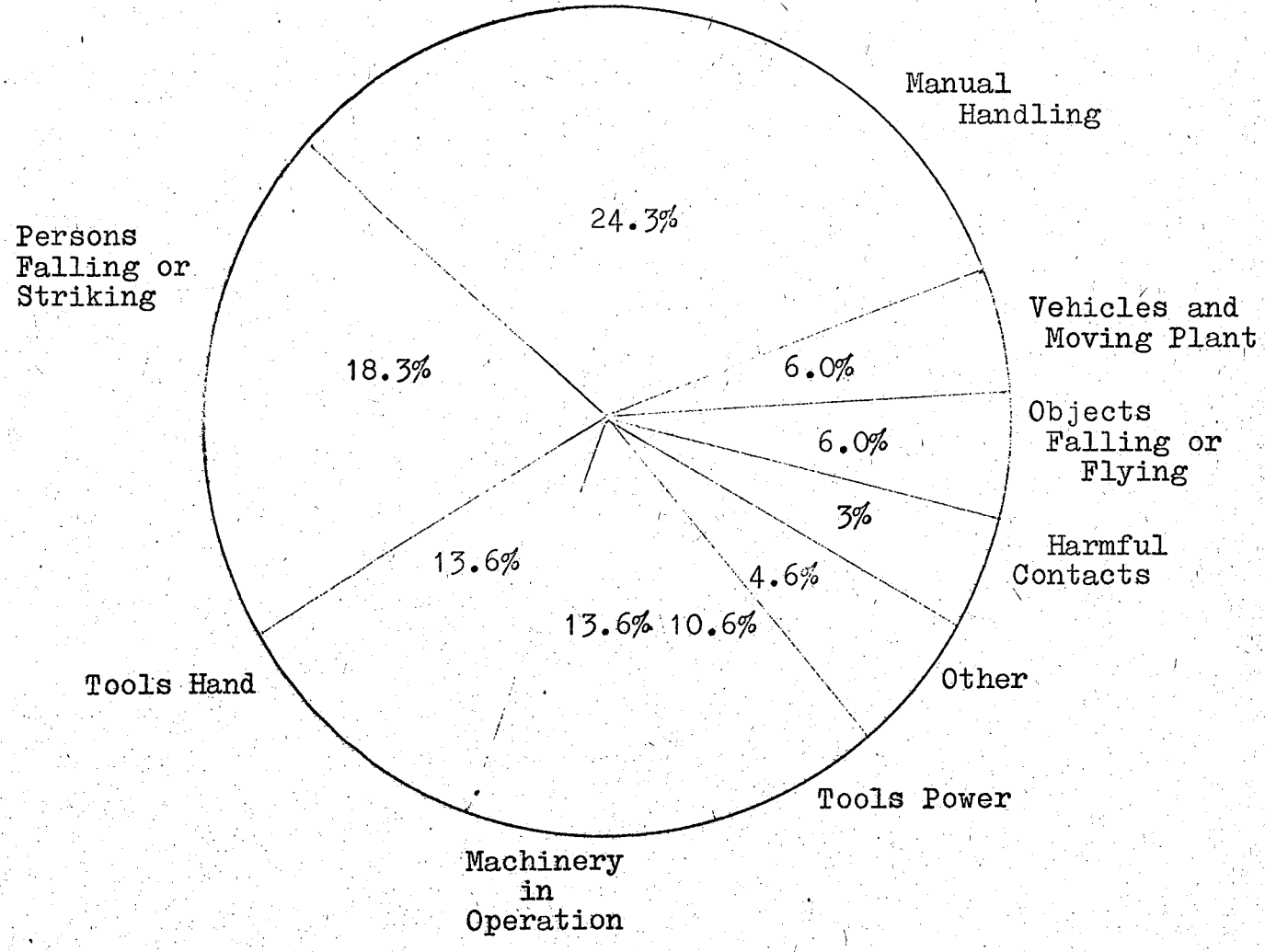
ALL INJURY F.R. = 105

AGENCY OF D.I.A.  
JULY-DECEMBER 1971



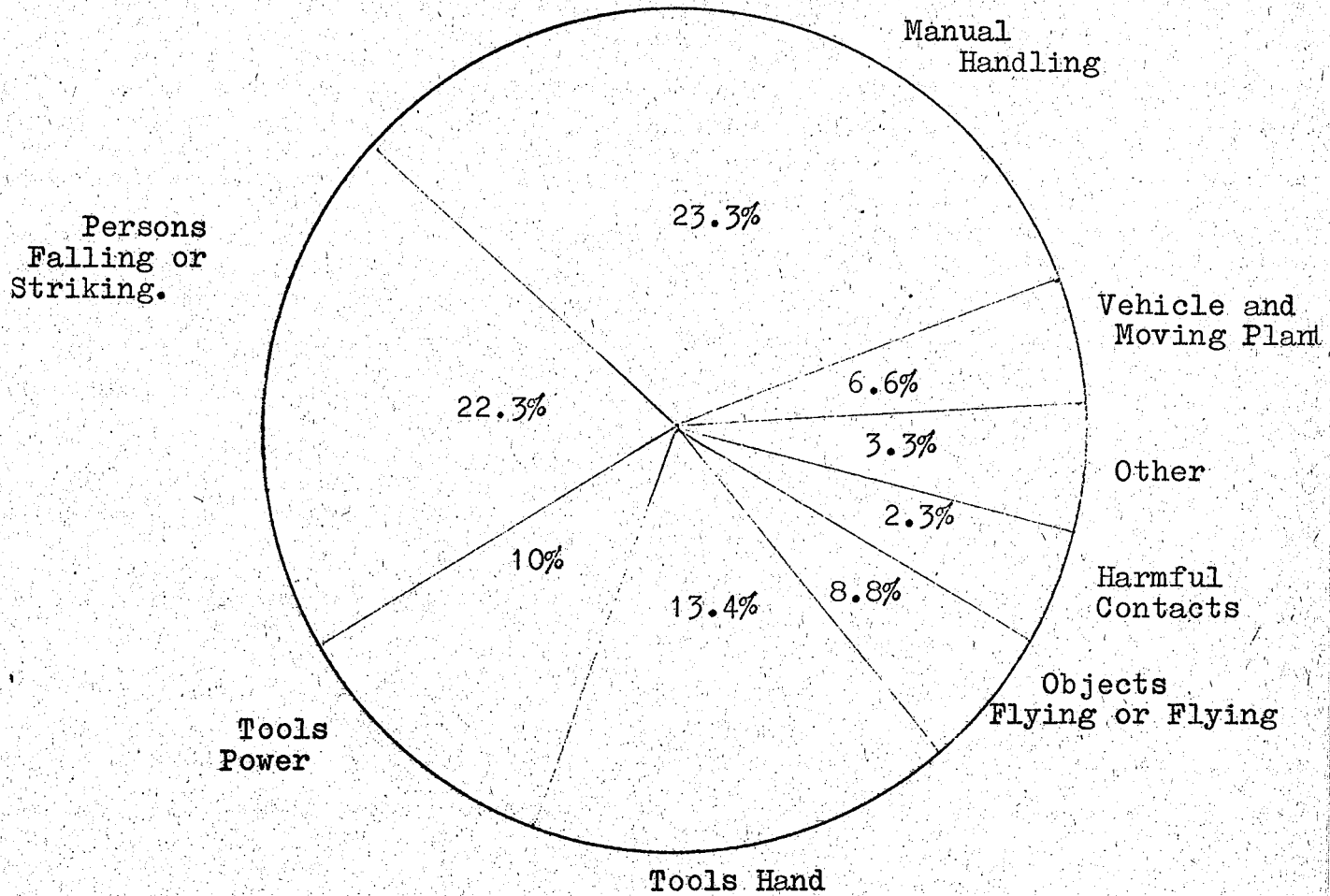


AGENCY SERIOUS INJURY ACCIDENTS  
JULY-DECEMBER 1971



## AGENCY OF ALL INJURY ACCIDENTS

JULY-DECEMBER 1971

**NOTE**

The injuries under the heading of "Harmful Contacts" and "Other" were Tick, insect bites, burns, and infections of no determined origin.

"SAFETY" IS SOUND - BUT IS IT "FIRST"? ...

The inspiring phrase "Safety First" was first adopted when the Safety movement was young. It was helpful in accelerating the idea of Safety.

Unfortunately, however, Safety is not ALWAYS, and perhaps never will be "first" in any operation or activity.

There is no question about it. Safety is sound. It is a subject in which more people should be concerned, and they probably all INTEND to give some real serious thought to it - "one of these days."

The trouble with Safety, is that it is GOOD for you; rather like spinach and educational films. It is only logical to check your vehicle before taking a long journey. It is only sane to wear suitable footwear when driving (flats or low-heeled shoes are best). It is commonsense to fasten your seat belt.

But let's face it. Who gets any thrill out of logic and sanity? Until, of course, one is injured in a wrecked car, or suffering from severe shock.

Safety is humanitarian. Safety is wholesome. Safety is good for everybody. It follows, naturally, that Safety is a crushing bore.

Human beings, on the whole, just can't work up much interest in the preservation of life and limb until the very last split second, WHEN OFTEN IT IS TOO LATE.

Indifference to Road Safety matters - failure to achieve a high level of driving proficiency and utilise fully all the Safety aids available, much less join vigorously in accomplishing improved solutions - is one of society's costly, but resolvable, problems.

(By Courtesy of Road Safety and Driver Education News.)

**PRECAUTIONARY MEASURE ...**

Although many drivers religiously lock the doors of their vehicles against the possibility of theft when leaving the vehicle parked, they expose themselves to death or injury by TRAVELLING with doors unlocked! EVEN WHEN A SEAT BELT IS BEING WORN, ALL DOORS SHOULD BE LOCKED.

Research has shown that doors fly open in certain sideswipe accidents, causing the driver or passenger to be either ejected or fall partially out of the vehicle. In the event of a second collision, or if the vehicle overturns, the danger is increased. Locking the doors also provides the additional protection of preventing intruders from entering the vehicle when not invited to do so.

(By Courtesy of Road Safety and Driver Education News).

**BUCKLE UP FOR SAFETY**

"Buckle up your seat belts where'er you drive,  
Just a little care will help you stay alive.  
When you're on the highways, please be courteous too,  
And you'll find that others will do the same for you.

Travel rules aren't hard; be sure you learn them too,  
And then you'll find your car will serve you well.  
Never put a life in danger; be friend and not a stranger.  
Buckle up your seat belts all the way. "

(The above jingle was submitted by Mr. & Mrs. J. Fordham  
of Doubleview, who suggest it could be sung to the tune  
of "I Love to Whistle.")

(By Courtesy of Road Safety and Driver Education News)

## THE TEN COMMANDMENTS FOR MOTORISTS

People in the 18 to 25 years age group make up 17 per cent of the driving population. But people in the 18 to 25 years age group also represent 42 PERCENT of the total number killed and injured on the roads. Young people have everything going for them in terms of driving skills. They have quicker reflexes, more precise judgement, greater anticipation. They also tend to drive way beyond the capabilities of their cars.

The National Safety Council says that accidents rarely have a single causation. They are generally caused by a combination of two or more factors, e.g. excessive speed and/or alcohol, inexperience, unroadworthy vehicle, failure to give right of way.

To help you avoid death or injury on the roads the council has formulated Ten Commandments for Motorists:

1. KNOW THE ROAD RULES BY HEART AND PUT THEM INTO PRACTICE.

The Road Rules are the drivers guide and by adhering to their precepts you will do much to make our highways safe and more pleasant for all. Drive according to the Road Rules and you drive safely and well.

2. CONCENTRATE ALL THE TIME AND YOU WILL AVOID ACCIDENTS.

Concentration is the keystone of all good driving. It is a primary duty but often a neglected one. Complete concentration will enable you to see and take notice of every detail. It is often the smallest detail that gives the clue to what will probably happen. If you miss such a detail, an accident, or at least an unpleasant experience may result.

Concentration will also ensure skilful handling of your car. It will prevent bad gear changes and late and fierce braking and practically do away with involuntary skidding, which is usually caused by the locking of the wheels by fierce braking on bad surfaces. Concentration assists anticipation.

### 3. THINK BEFORE ACTING

The theory that a good driver drives automatically is a fallacy. To the uninitiated he may appear to, but the truth is that, by continually concentrating and thinking he has raised driving to an art. Every corner, bend, gear change, in fact every driving operation, is a problem which, like every other problem can only be solved by thinking.

A thoughtful driver carries out every operation or manoeuvre in plenty of time and consequently is in the happy position of being able to accelerate away from danger or stop to avoid it. Think and avoid accidents.

### 4. EXERCISE RESTRAINT AND "HANG BACK" WHEN NECESSARY.

To "hang back" is to follow at a safe distance, a preceding vehicle, which you eventually intend to overtake, until you see the road ahead is clear for a sufficient distance to allow you to overtake with safety. This will call for the utmost restraint, especially when driving a fast car, but never be tempted to overtake or carry out any other manoeuvre unless it can be accomplished with 100 percent safety.

By exercising restraint, you automatically eliminate any tendency to impede other drivers by pulling in too quickly after overtaking an action often referred to as cutting in. When in doubt, hang back.

### 5. DRIVE WITH DELIBERATION AND OVERTAKE AS QUICKLY AS POSSIBLE.

Good driving continually calls for the making of quick and correct decisions, all of which must be carried



out with deliberation. Overtaking must always be accomplished in a minimum of time, so as to leave the road clear for others who may be travelling in the opposite direction or behind you.

A driver with a negative complex will sooner or later hesitate at the crucial moment, possibly with fatal results. Deliberation eliminates uncertainty.

6. USE SPEED INTELLIGENTLY AND DRIVE FAST ONLY IN THE RIGHT PLACES.

It is not always safe to drive at 35 m.p.h. in built up areas despite the fact that the law permits you to do so. In some circumstances such a speed is definitely dangerous. Where conditions permit, it is best to drive at an even speed of 35 m.p.h. as it assists in keeping traffic moving in an orderly and consistent stream. High speeds are safe only when a clear view of the road ahead is possible for a considerable distance

The speed in all cases must be governed by the amount of road that can be seen to be clear. Remember that, at 60 m.p.h. a car travels a distance of 88 feet per second. With many drivers, a second elapses between the seeing of an emergency and the applying of the brakes. Concentration and alertness are therefore absolutely imperative.

Any fool can drive fast enough to be dangerous.

7. DEVELOP YOUR CAR SENSE AND REDUCE WEAR AND TEAR TO A MINIMUM.

Car sense is the ability to get the best out of your car with a minimum of jerks and vibration. It entails smooth and thoughtful operation of the controls with hands and feet. This can only be achieved if the operations are carried out in plenty of time.

Car sense adds to your safety factor as you will always be in the right gear at the right time. Good car sense improves the life of your car.

8. USE YOUR HORN THOUGHTFULLY - GIVE PROPER SIGNALS.

Many drivers do not use their horn at all, some use it aggressively, others automatically and often unnecessarily. It is every bit as important that a person in front should be acquainted with your intention as a person behind, yet many drivers who never omit to give a hand signal consistently fail to give audible warning of their presence.

Use the signals given in the Road Traffic Regulations. An ambiguous signal is misleading and dangerous. Flicking the headlights at night is a very efficient form of signalling. Give good signals and earn the praise of fellow road users.

9. BE SURE YOUR CAR IS ROADWORTHY AND KNOW ITS CAPABILITIES.

A defective vehicle must never be taken out. To prevent this, go through the daily inspection as laid down. Before attempting to drive a strange car fast, become accustomed to its controls, acceleration, braking capabilities and characteristics. Car and driver must blend harmoniously to ensure good driving.

10. PERFECT YOUR ROAD CRAFT AND ACKNOWLEDGE COURTESIES EXTENDED TO YOU BY OTHER ROAD USERS.

Road craft includes every phase of driving. It is something more than road sense. Many people possess the latter but do not make the best use of it, owing to lack of control, inability to use the road and position their car to the best advantage.

A driver with good road craft knows how to avoid awkward and possibly dangerous situations. Good road craft not only prevents accidents, but makes driving less arduous. The road rules urge all to be courteous; but a good driver goes further and acknowledges the courtesies extended to him by every class of road user. By doing this, he sets a splendid example and does much to engender the spirit of chivalry so badly needed on our roads.

Courtesy is a great factor in road safety.

REGIONAL NOTESBUSSELTON REGIONStaff

The following staff changes have recently taken place-

DFO Jenkins transferred from Kirup to Perth  
DFO Keene transferred from Busselton to Kirup  
FOR. Beer from Dwellingup to Nannup  
ADFO Skillen from Dwellingup to Busselton  
F/O Pridham from Nannup to Dwellingup  
F/G Gorton from Manjimup to Margaret River  
F/G Sawyer from Margaret River to Ludlow  
ADFO McCutcheon has moved to Busselton to  
conduct a comprehensive soil survey of the  
Sunklands.  
T/A John Emery has been appointed to assist the  
Soil Surveyor.

Utilization

Chipwood utilization has moved from Folly Plantation to Ludlow for the winter. This has been found necessary to clear-fall part of the Ludlow Plantation on the wake of ilmenite mining.

Recreation

- 1) A picnic area has been developed at Wrights Bridge on the Nannup - Balingup Road, and a further site has been developed on Bussell Highway in the Tuart forest.
- 2) Old railway bridges on the Willows Formation are being preserved rather than demolished in plantation clearing.

GRIMWADE SEED AREA

Recent advice is that 304 bushells of *P. radiata* cones were collected, from which 222 lbs seed were extracted. This is equivalent to over half the Departments' annual requirement of 400 lbs of radiata seed.

## Safety

On Tuesday, February 15th, a presentation was made to Overseer Jack Driver making him a member of the Turtle Club. This is the fourth Departmental member of this exclusive Club, the membership of which is confined to people who have been saved from death or serious injury by the wearing of safety helmets. Driver was hit on head by large limb whilst falling jarrah tree and was knocked unconscious, but suffered no other injury.

## SOUTHERN REGION

### Staff

#### Staff Movements

George Peet (Act.F.O.O.) transferred from Manjimup to Como.  
 J. McAlpine promoted from A/F Quininup to For. Manjimup.  
 Don Grace (Supt) transferred from Manjimup to Perth.  
 Noel Ashcroft (ADFO) transferred from Walpole to Nannup.  
 C.J. Edwards transferred from Nannup to Manjimup as Act/Inspector.  
 Terry Court promoted to A/F at Quininup  
 Geoff McArthur (ADFO) transferred from Harvey to Walpole.  
 Max Campbell transferred from Pemberton to Walpole  
 Wayne Keals was appointed Forest Guard in training at Manjimup and was stationed at Glenoran.  
 Murray Love was appointed Forest Guard in training at Walpole.  
 Miss Ann Pollitt resigned to take up a position North of the 26th parallel. She was replaced by Miss Phyllis Hamilton.  
 Bob Brierley has been appointed District Forester at Collie and transferred from Pemberton in February  
 Bruce Harvey was appointed ADFO at Manjimup and allocated to regional duties.  
 Michela Drake Clerk/Typist at Pemberton since 1966, resigned in April. Her efficiency and cheerful demeanour will be greatly missed.

Enjoying the Eastern States weather on Long Service Leave, and fleeing from miscellaneous cyclones, thunderstorms, dustorms were:

Jack Bradshaw,  
 Don Grace,  
 Frank Vince.

### Visitors

Mr. Charles Cree from the Forestry and Timber Bureau, Canberra visited Manjimup recently, and inspected logging and milling operations in the Pemberton and Quininup area.

### Karri Nursery

A section of the West Manjimup Nursery was successfully sown to karri with the intention of raising open rooted karri under irrigation. To date germination has been satisfactory. The karri seedlings are planned for use in enrichment planting in regen.burn areas.

### Red Tingle Peelers

Three pile sized red tingles have been prepared as long length peelers at Walpole and will shortly be delivered to Westply and peeled to test this species.

This will be the first time to our knowledge that tingle has been tried for veneer production.

### Potato Boxes

One favourable result from the Department's show effort, where a bulk apple bin made from W.A. pine was on display, followed a short time afterwards, when Mr. Roy Booth of Manjimup called in to the Manjimup Office armed with a sample potato box, and asked if the department could supply this product. Following a flurry of measuring and a phone call to Alan Hill, we said we could.

Result: 100 potato bin shooks sold and a new market established.

### Karri-Tingle Regen.Burns

The first extensive regeneration burns in Karri-Tingle forest were carried out in January. The burns were generally successful, but raised some interesting and at times hair-raising problems in fire control.

Some 4000 acres of karri regeneration burning was successfully carried out in the Pemberton Division.

### Red Flowering Gum:

The red flowering gum patches in Ficifolia Block can now be inspected by car, following the completion of FARG work in the area. This species bursts into spectacular blossom in late summer and is well worth a trip to Walpole.

### Sand-dune Reclamation

Renewed interest and activity is being displayed with regard to sand dune consolidation in the Walpole area by both the Forests Department and the National Parks Board.

The National Parks Board have sought Department assistance on a recoup basis, to assist in this work, and some planting plus the establishment of marram grass nurseries is planned for next winter.

### C.U.R.A.R.A.

Two gangs were employed under the Commonwealth Unemployment Relief Aids Rural Areas Fund.

One gang is centered at Pemberton and the other at Manjimup. Both gangs are currently working on Karri thinning and tourist development projects.

### Pemberton National Parks

The Pemberton National Parks Board, mainly comprising local citizens, administered nearly 6000 acres of forest, the Pemberton Caravan Park and the Swimming Pool for some 30 years before being disbanded in 1971. A new board has been appointed to manage the parks and administer the Caravan Park and Swimming Pool. The new board comprises the Assistant Under Secretary for Lands (Chairman), a senior officer of the Department of Fisheries and Fauna and the Divisional Forest Officer at Pemberton.

HARVEY REGIONStaffTransfers

A.D.F.O. A.Lush to Wanneroo  
 A.D.F.O. P.Bryant to Harvey  
 D/F A.Handcock to Harvey from Collie  
 F/G N.Brown to Fire Control Como  
 F/G R.McIntyre to Working Plans  
 F/G R. Selkirk to National Service

Appointments

F/G I. Watson to Harvey  
 F/G A. Briggs to Dwellingup  
 F/G R. Mead to Collie.

Fire Control

In addition to the normal Aircraft Burning Programme approximately 17,000 acres of aircraft control burn of heavy fuel areas in coppice and prickles was carried out at Dwellingup.

The success of this operation has proved to be a major step forward in the elimination of heavy fuels and prickle in coppice areas resulting from the 1961 Dwellingup fire.

CURARA!

Forest Improvement work is being carried out under this scheme in Dwellingup and Harvey divisions.

To date the scheme appears to be a success, a good standard of employee has been obtained and very useful hardwood improvement programmes are being implemented.

A total of 15 men are currently employed on this scheme in Harvey Region.

## METROPOLITAN REGION

### Staff Changes

A number of staff changes have occurred in recent weeks as follows:

Miss S. Cowcher has transferred from Mundaring to Como Fire Control.

Miss M. Sisson has commenced in the office at Mundaring.  
Forest Guard Lex Mathews has commenced at Mundaring;  
Mr. D. Birch at Fire Control.

### Transfers

Mr. Brian Brodie from Collie to Head Office.  
Mr. Alan Lush from Harvey to Wanneroo

And we welcome back Mr. Gerald Van Didden from a prolonged rest on "Cloud Nine".

### Gang Competitions

The Metropolitan Region Champion Fire Gang for the first time in living memory is the Mundaring No. 1 Gang and congratulations go to Training Officer Kevin Pollock and Overseer Bob Thompson.

### Sport

A sophisticated series of cricket matches between Como, Wanneroo, Mundaring and Kelmscott has been devised by Forester Quicke and, despite interruptions caused by hot weather and inertia, the series is expected to conclude in late March.

### Cricket on a National Scale

Harvey versus Metropolitan Region at Harvey. A good roll up from Yanchep, Wanneroo, Gnangara, Mundaring, Como and Jarrahdale - 13 players in all. Harvey turned up with 18 players and shared 3 with Metro. Metro won 110 to 97.

### Highlights

Harvey's Blenchynden (ring-in from East Perth) fielded brilliantly to cut off a number of possible



boundary shots and threw in well over the stumps. Some very good bowling by Green, James and Blenchynden for Harvey. Blechynden later hit 20 runs from the last over he faced before being brilliantly caught on the boundary by the high flying John Brearly for 40 runs. Jim Raper was next highest score for Harvey with 16 not out.

For Metro. Alan Walker bowled well to dismiss a good player in James (Junior) and take one other valuable wicket.