

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

by

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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.

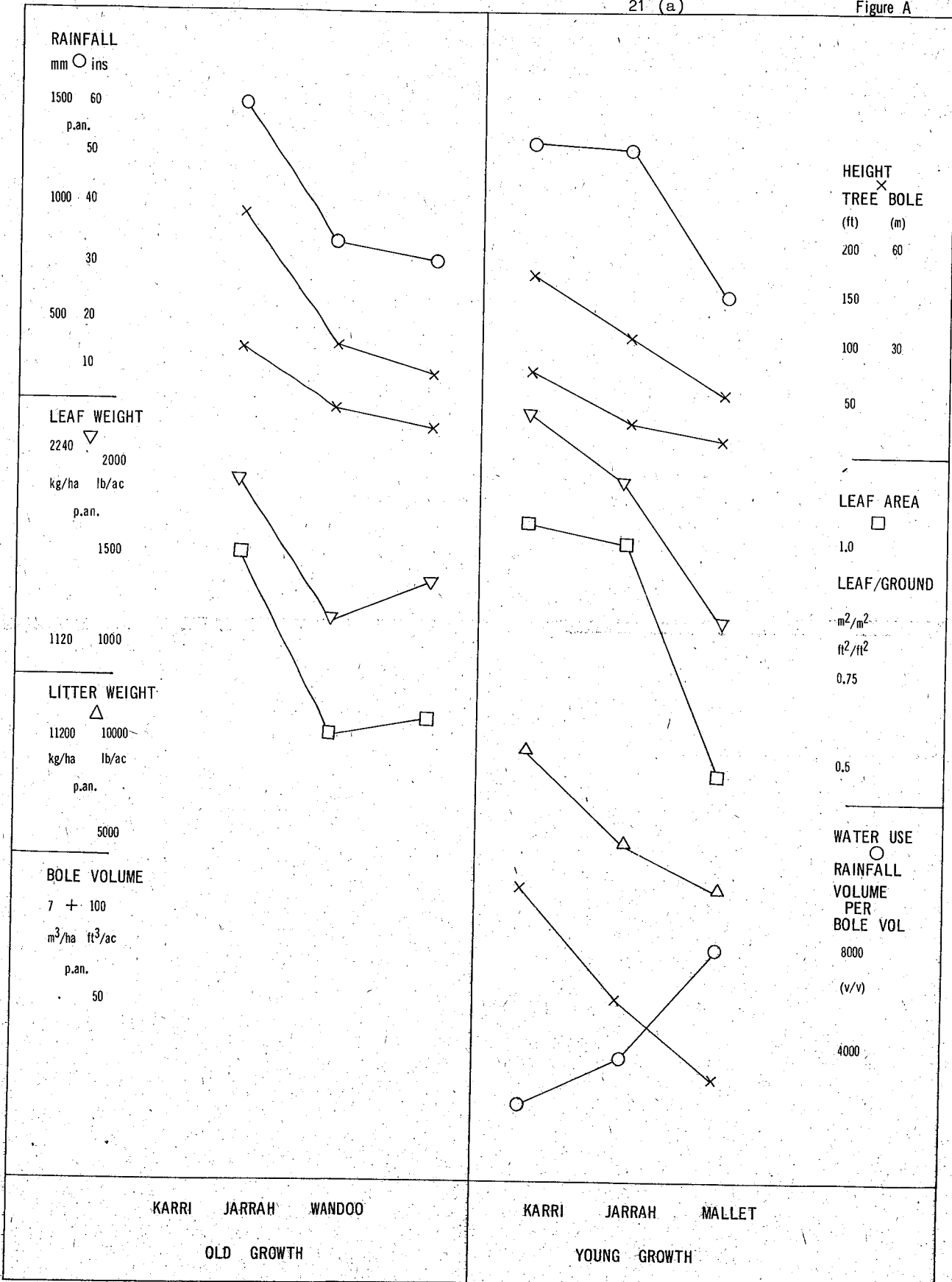


TABLE 1

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)	(hours)
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