

PROVISIONAL YIELD TABLE OF *EUCALYPTUS CAMALDULENSIS* IN PAKISTAN

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SUMMARY

In an earlier study (2) mean annual increment (MAI) of *Eucalyptus camaldulensis* was estimated to be 427 cft for a crop of age ranging from 6 to 8 years with the assumption that 700 trees per acre of the species were available at the above age i.e. planting was done with a spacing of 10' x 6' and no thinning was done and only 26 trees were lost on account of mortality or other factors. Under proper management the actual number of trees constituting main crop at the above age is almost half of the above figures. Therefore mean annual increment is less and ranges between 250 cft to 400 cft per acre for this spacing.

Basic data.

29 sample plots laid in different plantations of the Punjab in 1978 onwards with their annual measurements constitute the basic data. Details of sample plots are given in table 1.

Table 1. Details of sample plots of *Eucalyptus camaldulensis*
laid in irrigated plantations of the Punjab

S. No.	Plantation	Year of layout	Age at layout	No. of Measurements
1	Daphar	March 1978	14 years	3
2	Bhagat	Feb. 1978	9 "	3
3	"	"	10 "	3
4	"	"	11 "	3
5	Shorkot	March 1978	3 "	3
6	"	"	2 "	3
7	"	Feb. 1978	6 "	3
8	Kamalia	Jan. 1979	5 "	2
9	"	"	3 "	2
10	"	"	5 "	2
11	Chichawatni	Feb. 1978	12 "	3
12	Chak Katora	Jan. 1978	9 "	3
13	"	"	4 "	3
14	"	"	8 "	3
15	"	Feb. 1978	3 "	3
16	"	"	2 "	3
17	Lal Suhanra	May 1978	4 "	3
18	"	"	10 "	3
19	Bahawalpur	April 1978	2 "	3

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20	"	"	3	"	3
21 to 25	"	May 1978	3	"	15
26	Abasia	"	4	"	3
27	"	"	10	"	3
28	"	Feb. 1979	3	"	2
29	"	"	6	"	2
Total measurements					82

Method and Material

Annual measurements of all the sample plots were converted on unit area basis. Volumes of standing and thinned crops were calculated separately (1). Total volume for different ages was obtained by adding cumulative yield of thinnings for previous year to the standing volume.

As the sample plots were laid out in *Eucalyptus camaldulensis* plantations raised under different spacing viz. 5'x5', 10'x6' and 10'x10' the growth statistics for one spacing differed widely from others. To get an idea about growth parameters the measurements were grouped according to spacings. Six measurements were rejected being abnormal leaving 76 measurements which were finally used in the study. Data grouped as above gave the following information.

Spacing	No. of measurements	Age range-years
i) 5' x 5'	21	2 - 5
ii) 10' x 6'	14	3 - 8
iii) 10' x 10'	41	2 - 16

Growth parameters were obtained for each spacing and each age group on unit area basis. Table 2 and 3 given below show the parameters in British and metric units respectively.

Table 2:— *E. camaldulensis* Yield/acre under different spacings

(British units)

Age years	Main Crop						Total including thinnings		
	No. of measurements	No. of trees	dbh in	Ht. ft	B.A. ft ²	Volume ft ³	No.	Vol. ft ³	MAI ft ³
Spacing 5' x 5'									
2	1	685	3.2	31	47.19	940.93	1433	1396.86	698.43
3	7	586	4.0	43	53.85	1196.68	1598	1779.71	593.24
4	7	557	4.5	46	62.69	1405.37	1598	2046.17	509.29
5	6	487	5.3	51	72.00	1560.03	1626	2277.97	455.59
Spacing 10' x 6'									
3	2	512	4.1	37	45.26	896.67	737	1028.16	342.72
4	4	424	4.9	44	53.67	1220.43	707	1631.03	407.76
5	3	367	5.5	48	58.98	1288.60	703	1856.45	371.29
6	3	317	6.2	54	63.53	1389.87	715	2095.67	349.28
7	1	407	5.3	52	59.50	1258.93	789	1709.29	244.18
8	1	404	5.4	53	63.93	1431.25	789	1888.93	236.12
Spacing 10' x 10'									
2	2	376	3.0	27	16.73	376.87	541	472.51	236.25
3	2	468	2.3	25	16.10	365.79	618	427.31	142.44
4	4	301	5.4	44	47.42	999.78	505	1221.53	305.38
5	4	269	5.8	51	49.42	1086.94	458	1339.73	267.95
6	3	247	6.3	55	53.61	1201.56	452	1515.16	252.53
7	1	267	7.6	62	85.49	1909.67	389	2170.56	310.08
8	1	144	9.8	76	74.32	1700.80	210	2004.40	250.55
9	3	151	10.4	79	90.27	2199.79	221	2445.71	271.75
10	6	164	10.2	78	83.55	1987.75	263	2352.88	235.29
11	6	160	10.1	77	85.18	2059.03	265	2435.76	221.43
12	5	150	10.8	76	83.84	2033.17	244	2347.14	195.59
13	1	124	10.9	77	80.53	1975.29	223	2449.70	182.28
14	1	168	9.7	73	86.25	1948.57	286	2464.11	176.01
15	1	154	10.0	74	62.54	2000.54	286	2580.90	172.06
16	1	154	10.5	76	91.39	2196.96	286	2777.32	173.58

Table 3:— *E. camaldulensis* Yield/hectare under different spacings

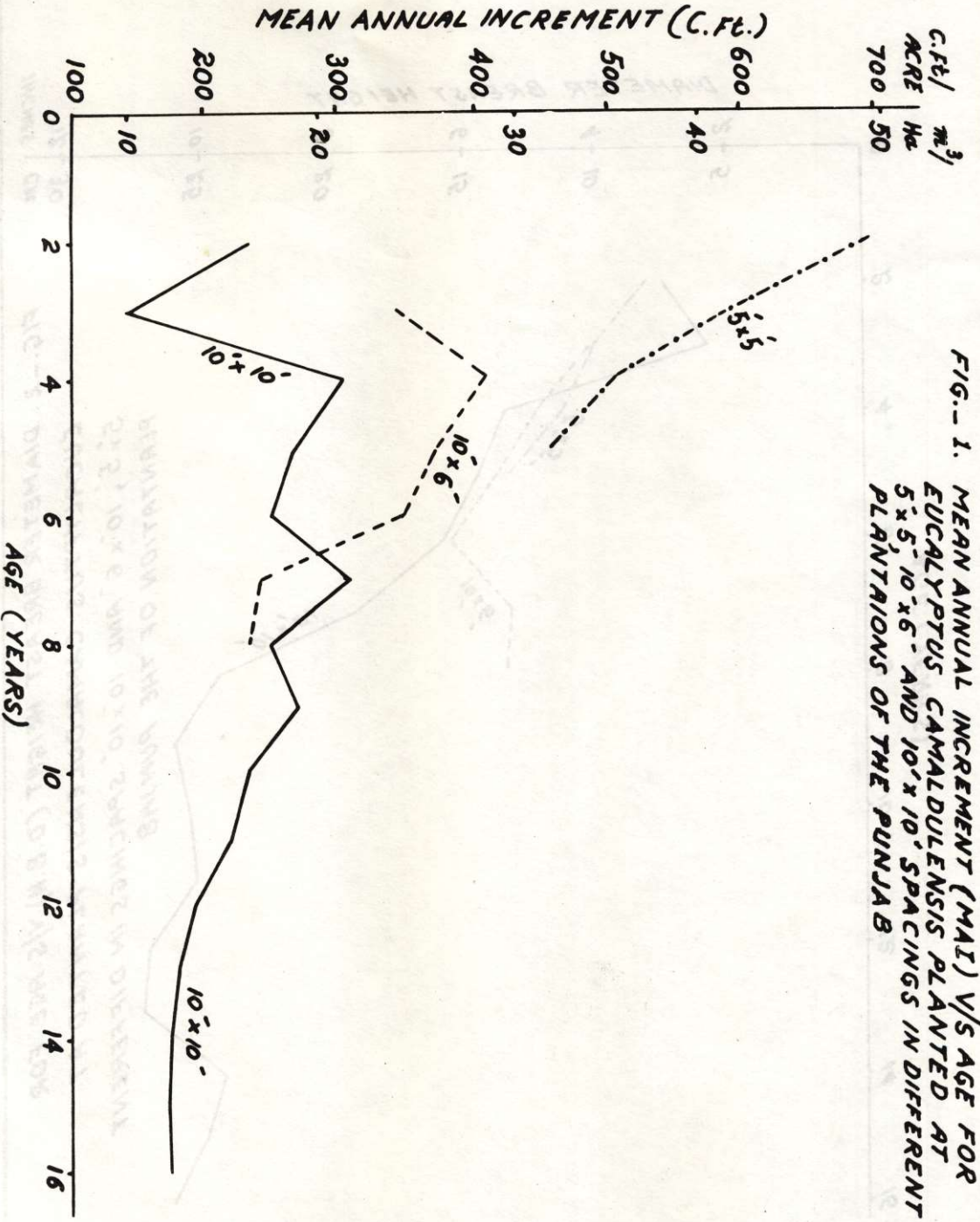
(Metric Units)

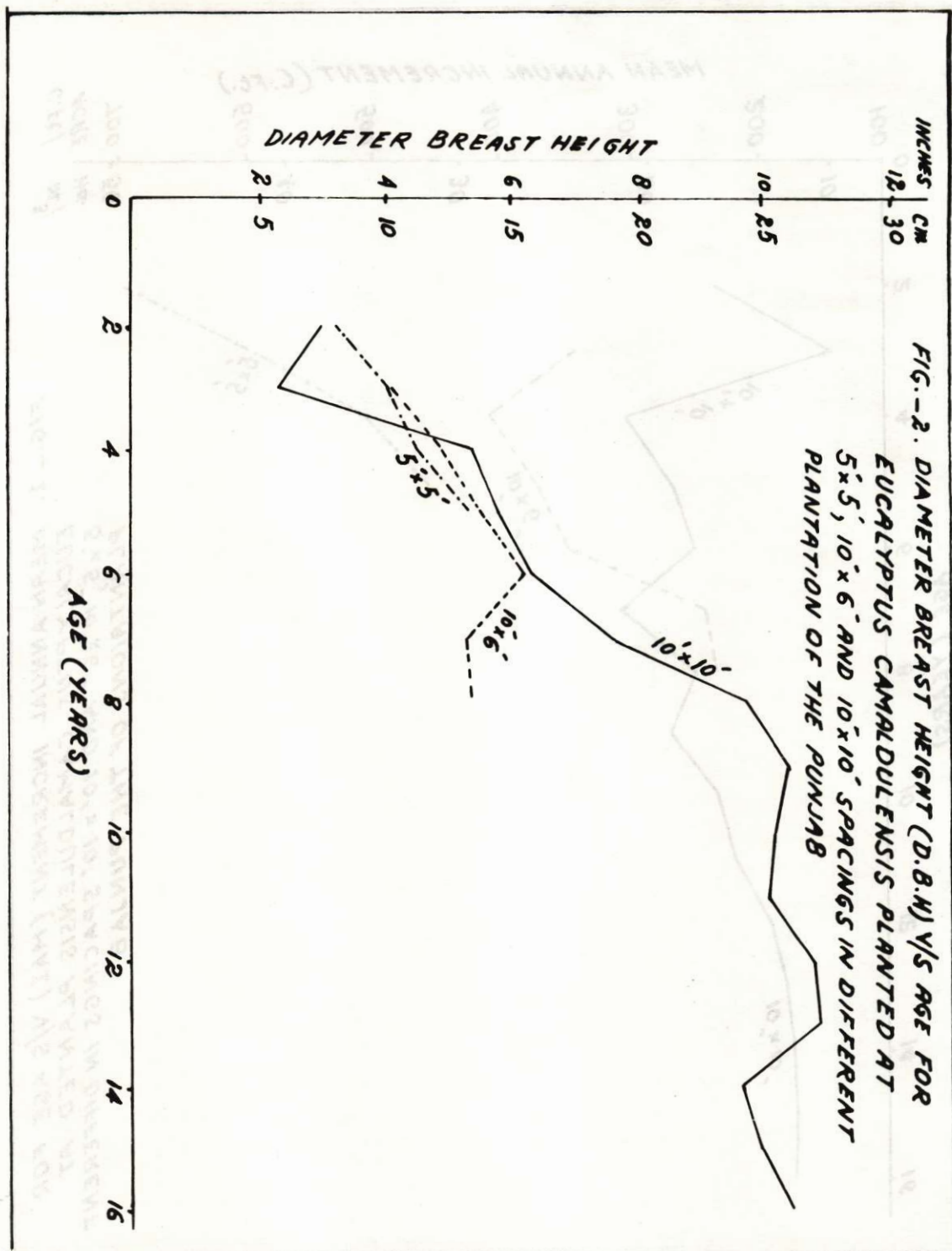
Age years	No. of measurements	Main Crop					Total		
		No. of trees	dbh cm	Ht. m	B.A. m ²	Vol. m ³	including thinnings		
							No.	Vol. m ³	MAI m ³
Spacing 1.5 m x 1.5 m									
2	1	1692	8.1	9.4	10.833	65.840	3540	97.742	48.871
3	7	1447	10.2	13.1	12.362	83.735	3947	124.532	41.511
4	7	1376	11.4	14.0	14.392	98.338	3947	143.177	35.637
5	6	1203	13.5	15.5	16.529	109.160	4016	159.396	31.879
Spacing 3 m x 1.8 m									
3	2	1265	10.4	11.3	10.390	60.853	1820	71.943	23.981
4	4	1047	12.4	13.4	12.321	85.397	1746	114.128	28.532
5	3	906	14.0	14.6	13.540	90.167	1736	129.901	25.980
6	3	783	15.7	16.5	14.584	97.253	1766	146.640	24.440
7	1	1005	13.5	15.8	13.659	88.091	1949	119.604	17.086
8	1	998	13.7	16.2	14.676	100.149	1949	132.174	16.522
Spacing 3 m x 3 m									
2	2	929	7.6	8.2	3.841	26.371	1336	33.063	16.531
3	2	1156	5.8	7.6	3.696	25.595	1526	29.900	9.967
4	4	743	13.4	13.4	10.886	69.958	1247	85.474	21.368
5	4	664	14.7	15.5	11.345	76.056	1131	93.745	18.749
6	3	610	16.0	16.8	12.307	84.077	1116	106.020	17.670
7	1	659	19.3	18.9	19.626	133.625	961	151.880	21.697
8	1	356	24.9	23.2	17.061	119.010	519	140.254	17.532
9	3	373	26.4	24.1	20.723	153.926	546	171.134	19.015
10	6	405	25.9	23.8	19.180	139.089	650	164.638	16.464
11	6	395	25.7	23.5	19.555	144.077	655	170.437	15.494
12	5	370	27.4	23.2	19.247	142.267	603	164.236	13.686
13	1	306	27.7	23.5	18.487	138.217	551	171.413	12.755
14	1	415	24.6	22.2	19.800	136.347	706	172.421	12.316
15	1	380	25.4	22.6	14.357	139.984	706	180.593	12.040
16	1	380	26.7	23.2	20.980	153.728	706	194.337	12.146

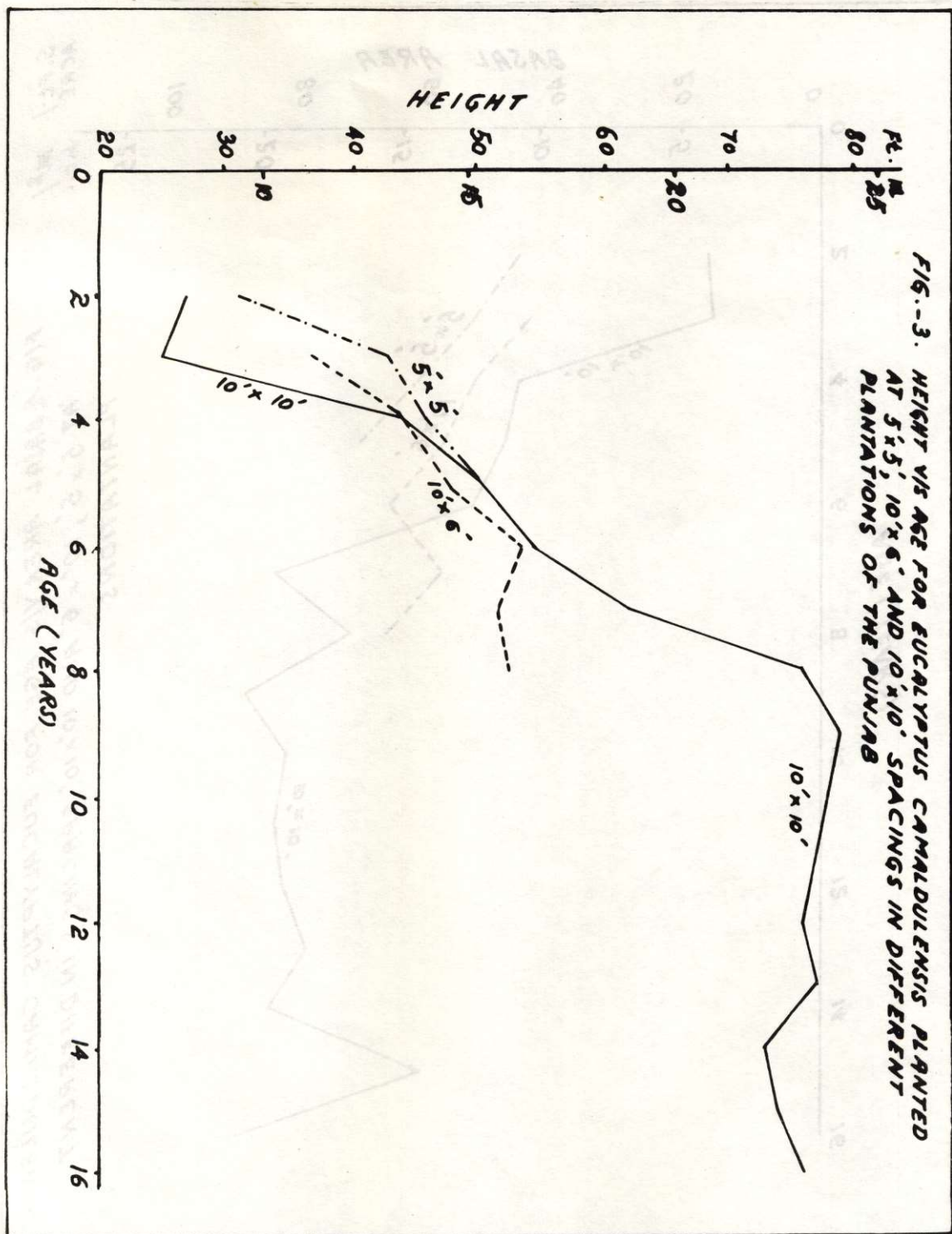
The trend of different growth parameters was observed graphically by plotting these against age for different spacings. The following figures show the trend.

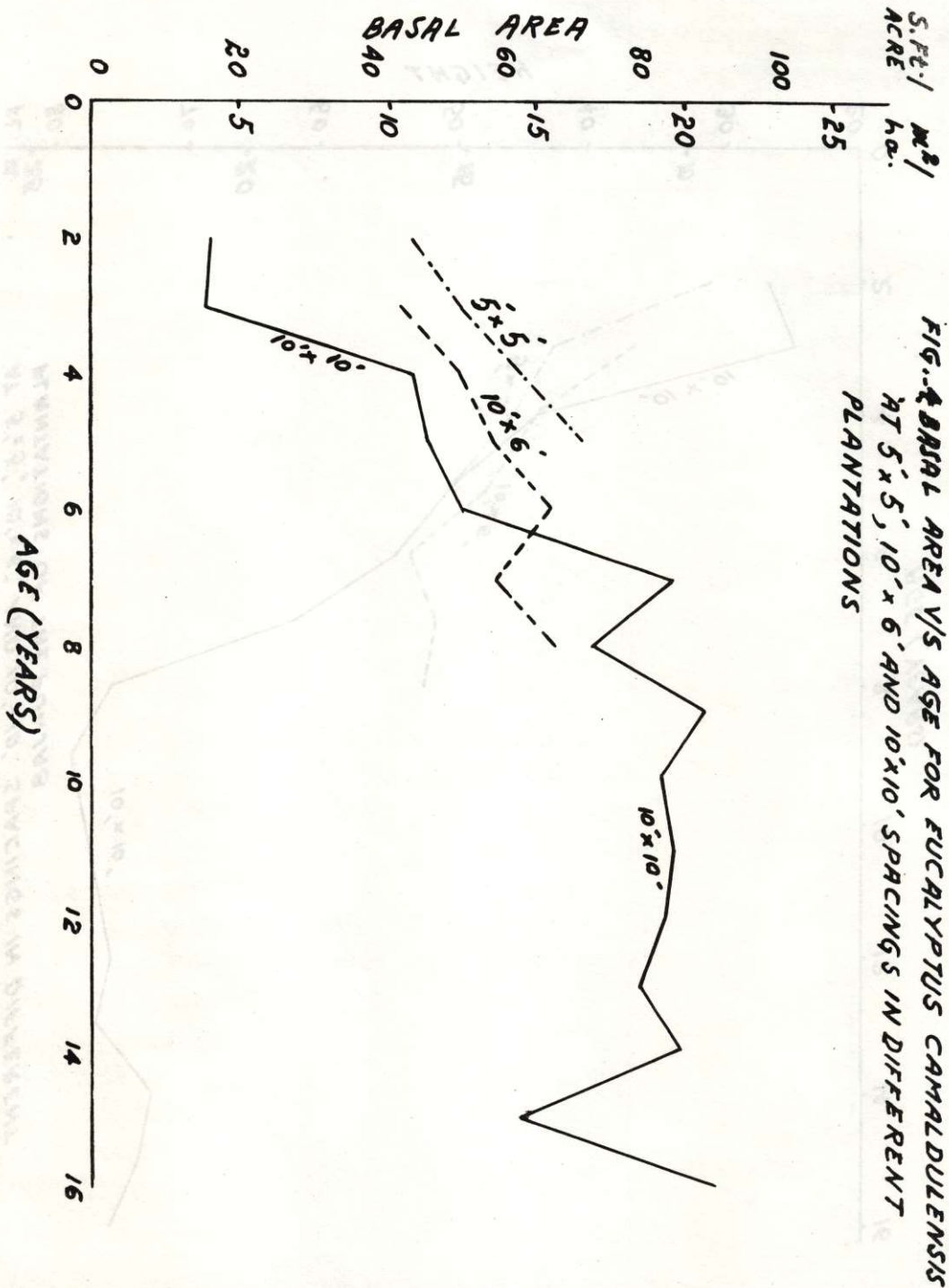
Fig. 1. Mean annual increment (MAI)

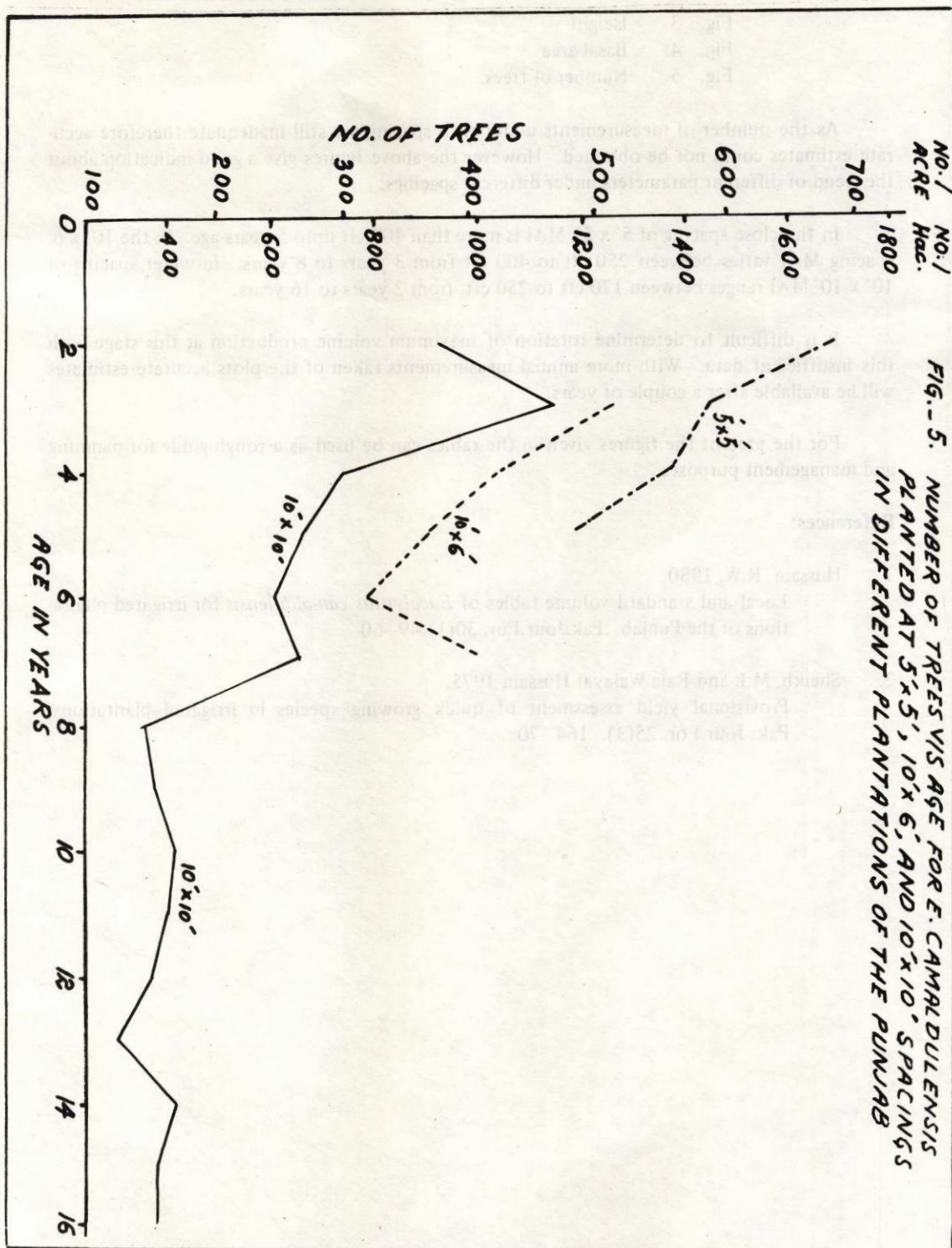
Fig. 2. Diameter breast height (DBH)











- Fig. 3. Height
Fig. 4. Basal area
Fig. 5. Number of trees.

As the number of measurements under each spacing are still inadequate therefore accurate estimates could not be obtained. However the above figures give a good indication about the trend of different parameters under different spacings.

In the close spacing of 5' x 5', MAI is more than 400 cft upto 5 years age. In the 10' x 6' spacing MAI varies between 250 cft to 400 cft from 3 years to 8 years. In wider spacing of 10' x 10' MAI ranges between 170 cft to 250 cft. from 2 years to 16 years.

It is difficult to determine rotation of maximum volume production at this stage with this insufficient data. With more annual measurements taken of the plots accurate estimates will be available after a couple of years.

For the present the figures given in the tables can be used as a rough guide for planning and management purposes.

References:

1. Hussain, R.W. 1980.
Local and standard volume tables of *Eucalyptus camaldulensis* for irrigated plantations of the Punjab. Pak.Jour.For. 30(1):49-60
2. Sheikh, M.I. and Raja Walayat Hussain 1975.
Provisional yield assessment of quick growing species in irrigated plantations. Pak. Jour.For. 25(3): 164-70.