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LEAF GROWTH IN RELATION TO AGE AND THE BEARING STATUS OF COCONUT PALMS

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A study was carried out recently to determine (*a*) the leaf growth (or size) in relation to age, and (*b*) the relation between leaf size and bearing status of coconut palms (*Typica* variety).

METHODS AND MATERIALS

Coconut palms from five age-groups were selected for this study. They were, 5, 10, 20, 30 and over 50 year old palms. For each age-group a uniform block was selected and from each such block 30 healthy-looking palms were chosen for recording of measurements. Ideally all categories should satisfy the following requirements:—

(*a*) Be from the same agro-climatic region.
(*b*) Receive identical manurial and cultural treatments.
(*c*) Be of the same type and distance of planting.

It was not possible to select the different categories in the same agro-climatic region. However, the blocks selected were from areas which had well drained sandy-loams, and displayed similar soil physical structures. The manurial treatments and cultural practices, on these blocks could be considered effectively uniform. The type and distance of planting in the different categories are shown in the schedule below:—

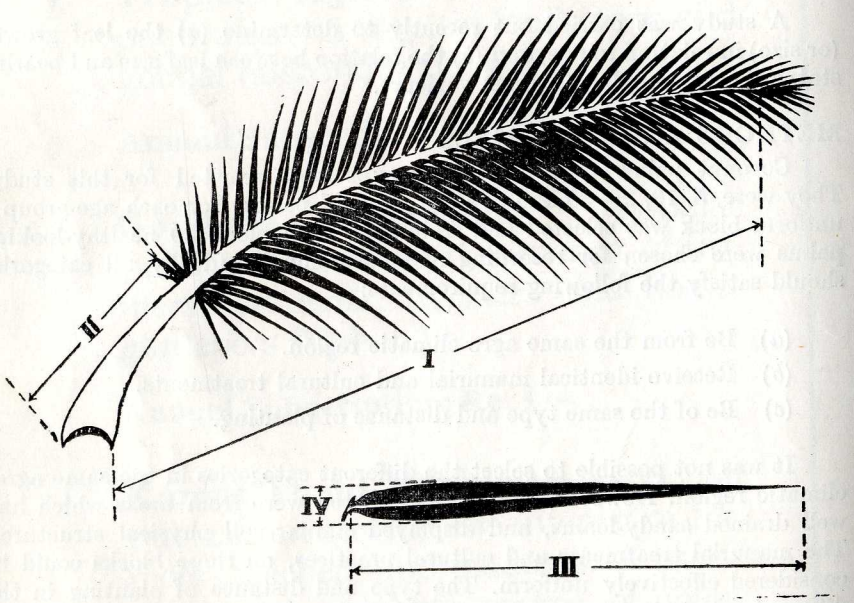
Age of palms (years)	*Location**	*Type of planting*	*Planting distances*
5	Pothukulama	Rectangular	26′ × 24′
10	Bandirippuwa	Triangular	26′ × 26′
20	Walpita	Square	24′ × 24′
30	Ratmalagara	Triangular	26′ × 26′
Over 50	Bandirippuwa	Square	26′ × 26′

* Following experiments are in progress at these locations: Pothukulama—Diallel crosses, Bandirippuwa—Progeny Trial, Walpita—Progeny Trial, Ratmalagara—Latin square, Bandirippuwa—Observation.

In the case of the two younger categories, bearing and non-bearing were studied separately.

In all age categories the following measurements (Figure I) were recorded in the most mature and healthy green frond of each palm.

1. Total length of frond.
2. Length of petiole.
3. Length of the longest leaflet.
4. Breadth of the longest leaflet.
5. Total number of leaflets.



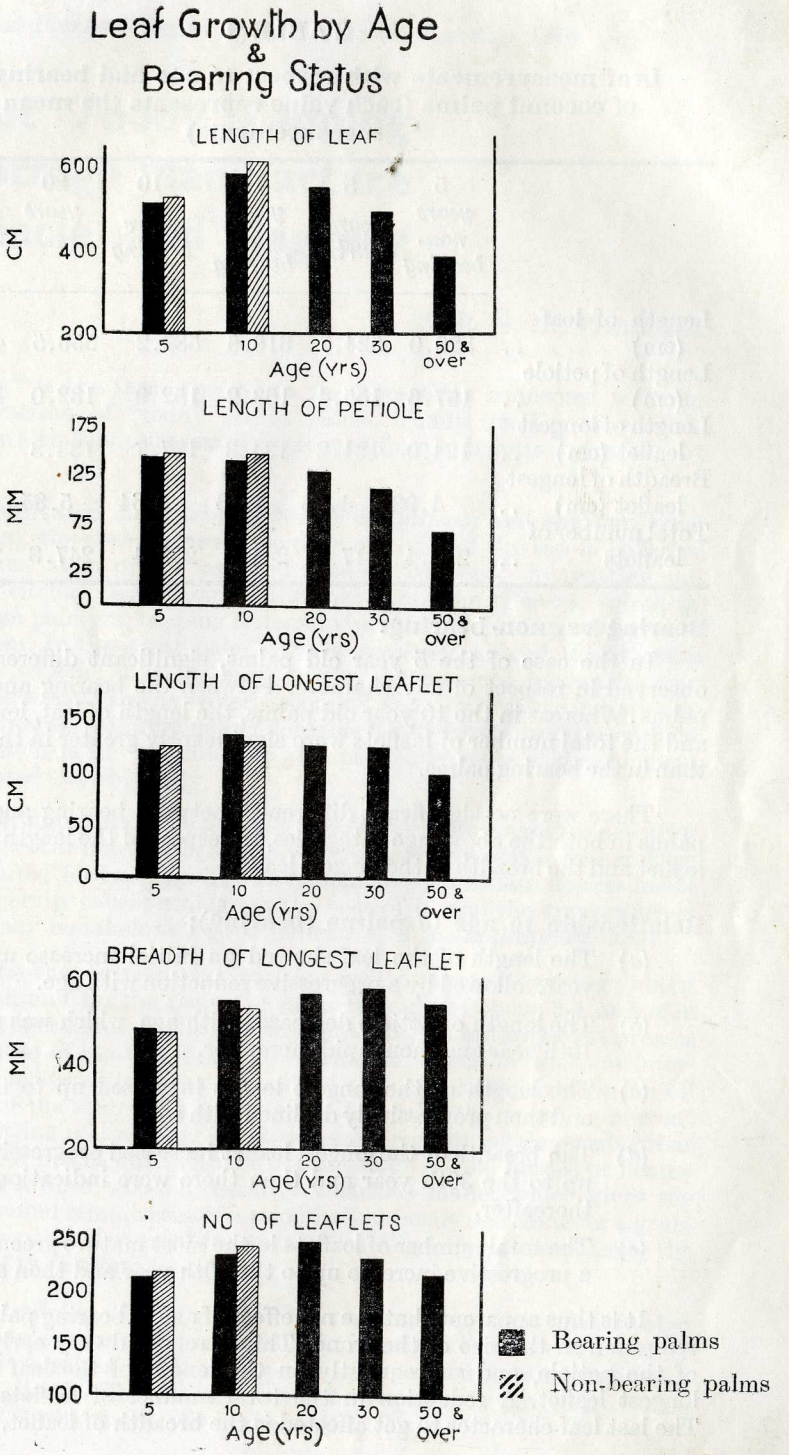
(FIGURE I)

Leaf Measurements;

I Length of Frond.	III Length of Leaflet.
II Length of Petiole.	IV Breadth of Leaflet.

RESULTS AND DISCUSSION

The results are given in Table I and are also illustrated by histograms in Figure II.


Leaf Growth by Age
&
Bearing Status
LENGTH OF LEAF
CM
600
400
200
5
10
20
30
50 & over
Age (yrs)
LENGTH OF PETIOLE
MM
175
125
75
25
0
5
10
20
30
50 & over
Age (yrs)
LENGTH OF LONGEST LEAFLET
CM
150
100
50
0
5
10
20
30
50 & over
Age (yrs)
BREADTH OF LONGEST LEAFLET
MM
60
40
20
5
10
20
30
50 & over
Age (yrs)
NO OF LEAFLETS
250
200
150
100
5
10
20
30
50 & over
Age (yrs)
Bearing palms
Non-bearing palms

(FIGURE II)

TABLE I

Leaf measurements with respect to age and bearing status of coconut palms (each value represents the mean of 30 measurements)

	5 *years non-bearing*	5 *years bearing*	10 *years non-bearing*	10 *years bearing*	20 *years*	30 *years*	*Over* 50 *years*
Length of leaf (cm) ..	528.0	524.7	616.6	586.2	556.5	469.9	383.0
Length of petiole (cm) ..	157.6	155.4	163.2	152.9	132.0	119.6	70.5
Length of longest leaflet (cm) ..	124.9	121.2	134.3	137.7	133.8	134.6	106.7
Breadth of longest leaflet (cm) ..	4.93	4.96	5.46	5.64	5.85	5.90	5.67
Total number of leaflets ..	219.4	217.8	241.6	233.4	247.8	233.9	218.8

Bearing vs. non-bearing:

In the case of the 5 year old palms, significant differences were not observed in respect of any character between the bearing and non-bearing palms. Whereas in the 10 year old palms, the length of leaf, length of petiole and the total number of leaflets were significantly greater in the non-bearing than in the bearing palms.

There were no significant differences between bearing and non-bearing palms in both the above age categories, in respect of the length of the longest leaflet and the breadth of the longest leaflet.

Relationship to age of palms (bearing):

(*a*) The length of the leaf showed an initial increase up to the 10th year, followed by a progressive reduction with age.

(*b*) The length of petiole decreased with age, which was slow up to the 10th year and then rapid thereafter.

(*c*) The length of the longest leaflet increased up to the 10th year, and then progressively declined with age.

(*d*) The breadth of the longest leaflet increased progressively with age, up to the 30th year and then there were indications of a decline thereafter.

(*e*) The total number of leaflets in the most mature green frond showed a progressive increase up to the 20th year and then a decline.

It is thus apparent that the net effect of age in bearing palms is a general reduction in the size of the frond. This is reflected very early in the length of the petiole, and subsequently on the length of the leaf and length of longest leaflet. A reduction in the total number of leaflets follows next. The last leaf character to get affected is the breadth of leaflet.