

MINIMUM GROWTH STANDARDS FOR COCONUT SEEDLINGS IN CITRONELLA LANDS IN THE SOUTHERN PROVINCE

**V. Abeywardena
and
W. V. Fernando**

Introduction

At the request of the Chief Advisory Officer of the Coconut Research Institute of Ceylon, a survey was carried out by us with the assistance of the Field Officers in the Citronella Subsidy Scheme. The objective was to lay down minimum growth standards for coconut seedlings grown under the citronella subsidy scheme in the southern province.

Survey

As the holdings under the Citronella Scheme covered a vast area with rainfall varying from 40 inches to 120 inches or more per year and soil types varying from the flat and sandy areas to hilly and gravelly areas, the survey had necessarily to take into consideration at least some of these factors which may have some bearing on growth.

(a) Rainfall

As rainfall is an important factor in growth, the area was divided into 3 rainfall zones as shown in the map. Zone A: less than 50 " rainfall per year; Zone B: 50 "-75 "; and Zone C: over 75 ". Measurements were taken from representative holdings in each zone so as to enable standards to be laid down separately for each zone.

(b) Soil types

The selection of holdings representative of the common soil types in each of the rainfall zones posed a problem. It was not possible (and understandably so) for any field officer to say what soil type each holding was in, until we went to the actual spot. Due to this reason, unless we were prepared to survey every holding in the scheme, it was not possible to obtain growth measurements representative of classified soil types in each rainfall zone.

It was accordingly decided to carry out the survey irrespective of soil types. The soil type of each holding visited was however noted down for possible use in the final analysis.

Fortunately it appears to be a significant feature that each of the rainfall zones demarcated above, contained certain specific ranges of soil types. It was observed that (1) in the heavy rainfall areas (Zone C) most lands were gravelly and hilly; (2) in the medium rainfall zone (i.e. B) the topography ranged from flat to moderately hilly and the soil ranged from sandy loam to gravel and (3) in the low rainfall zone (i.e. A) the topography was mostly flat and the texture sandy (sometimes clayey) with a characteristically high water table.

It was accordingly decided to take growth measurements in these three rainfall zones which incidentally reflected also the above ranges of soil types.

(c) *Growth measurements*

Two characters were measured to indicate growth:

(1) *Number of leaves*

This included in addition to existing leaves, a count of old (or dead) and cut leaves—thus giving the total number of leaves produced by the seedlings from the time of germination.

(2) *Girth*

During the seedling stage one hardly observes any trunk or girth. The only possible measurement was the girth when all the leaf petioles are brought together firmly in their normal position. The measurement is taken 6 inches above the ground level—the latter being the level in the seed hole and not the normal ground level.

(d) *Reliability of measurements*

The girth measurement showed large variations both within a holding as well as from holding to holding in each rainfall zone—in fact more than the variation observed between rainfall zones. The variability of the leaf count is less so. This high variability in the girth measurement is largely due to errors of measurement due to practical difficulties more than inherent variation due to soil and plant differences. This is specially so after the second year of growth. Therefore the girth could be considered as a reliable growth criterion only within the first two years from transplanting; thereafter until the stem is formed it is a very unreliable index.

On the other hand, leaf counts may be a relatively more reliable guide.

Details of the analysis which lead to these conclusions regarding the reliability of growth criteria are not incorporated in this report but are available for reference.

(e) *Growth standards*

In judging a plantation there are 2 critical levels to be considered viz: (1) a suspect level and (2) a reject level.

The "suspect level" is such that in a normally managed population of plants, only 10% will in the long run record values below it. Statistically we say that the probability of getting such a value or less is 10%. Therefore such a value is not quite likely and makes us suspect that such a holding may not be well managed.

The "reject level" is the 5% level. Any value equal to or less than this value is possible only in 5% of the population of plants and is therefore very unlikely. In such a situation, one could without much risk of an unfair judgement, accept that the holding is neglected.

Table 1 gives these standards for the 3 rainfall zones and for different ages of plants ranging from 12 months with 3 monthly intervals upto 36 months.

(f) *The use of the standards*

The use of the standards laid down in the table is fairly simple. From the holdings, take the girth measurement and leaf count of 20 plants selected at random. The simplest approach to select plants at random in the field will be to start with any plant and proceed along each row (in a serpentine order) taking every 3rd or 4th or 5th plant as the case may be, until one completes the measurement of 20 plants. A guidance as to whether every 3rd or 4th or 5th is to be selected is given in Table 1. Having obtained the total number of leaves for 20 plants in the holding, one could compare same with the standards given in Table 2, for the corresponding age of the holding, and decide as follows:—

(i) O-kay:

If the observed level is higher than the suspect level, the Holding may be considered to be fairly well managed.

(ii) Suspect:

If the observed level is between the reject level and the suspect level, one has to examine the environment to decide whether to OK it or reject it. If the soil type is poor compared to the normal soil type in the zone, one may okay it. For example, in the heavy rainfall zone, a gravelly soil is quite normal and cannot be considered poor whereas in the medium rainfall zone such a soil may be considered poor. Again in the heavy rainfall zone, if one meets with a clayey soil, one may consider it a poor soil. One may also meet with highly water logged conditions in any rainfall zone. Such soils may be considered poor in any zone.

On the other hand, if one is confident that the holding has a very good soil for the rainfall zone in question and if there are no other factors that may predispose to poor growth, one may reject such a holding although within the suspect level.

This is a situation where the person judging the holding has to exercise certain amount of care in his judgement. On this point of deciding what is the normal range of soil types for a particular rainfall zone, what is above or below normal and what could be considered extremely poor, or extremely good, it would be helpful to get information from a more knowledgeable source.

(iii) Reject:

If the observed value is below the reject level, one may brand it as a neglected holding unless the soil type is *extremely* poor.

The girth standards shown in Table 3 may also be made use of to confirm one's judgement based on leaf production, but not as a criterion by itself.

Acknowledgements

Our grateful thanks are due to Mr. C. A. Wickremasuriya, Chief Advisory Officer, C.R.I., who suggested this survey and gave us all the co-operation and also to Messrs. S. Jayanetti and J. B. Galagedera (Advisory Field Officers) and their Field Attendants who ungrudgingly stood the brunt of the Field work in this survey.

TABLE 1
RANDOM SELECTION OF PLANTS

<i>Total No. of plants in holdings</i>	<i>Which plant to be selected</i>
40	Any 20 plants
40 — 60	*every other plant
60 — 80	*every 3rd plant
80 — 100	*every 4th plant
100 — 120	*every 5th plant
120 — 140	*every 6th plant
,	,
,	,
,	,

* Total number of plants to be measured is 20.

TABLE 2
GROWTH — LEAF NUMBER
(20 seedlings)

		TOTAL LEAF COUNT AT AGE (MONTHS)									
		12	15	18	21	24	27	30	33	36	
ZONE (A)	REJECT 5%	123	133	142	150	158	165	171	177	183	
	SUSPECT 10%	126	136	145	153	161	167	174	180	185	
ZONE (B)	REJECT 5%	128	144	158	171	183	194	205	215	225	
	SUSPECT 10%	132	147	161	174	180	197	207	217	227	
ZONE (C)	REJECT 5%	137	145	152	158	163	167	172	176	180	
	SUSPECT 10%	140	148	155	160	165	170	174	178	182	

TABLE 3
GROWTH—GIRTH
(20 seedlings)

		<i>TOTAL GIRTH AT AGE</i> (MONTHS)				
		12	15	18	21	24
ZONE (A)	REJECT 5%	103	128	153	178	202
(LOW RAINFALL)	SUSPECT 10%	106	131	157	182	207
ZONE (B)	REJECT 5%	108	149	195	245	298
(MEDIUM RAIN- FALL)	SUSPECT 10%	110	152	199	248	301
ZONE(C)	REJECT 5%	122	141	160	178	194
(HIGH RAINFALL)	SUSPECT 10%	124	145	164	182	200

NOTE BY THE EDITOR

An article received from Mr. Primson Fernando, J.P. of Heenpannawa Group, Bingiriya, in response to our appeal for articles from coconut planters appears on the opposite page. Mr. Primson Fernando's desire to share his experience with others is praiseworthy.

We do not however endorse all the views expressed in the article.

Editor.