

EFFECT OF SEEDNUT TRIMMING ON THE GERMINATION AND GROWTH OF COCONUTS

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ABSTRACT

In a trial to compare the growth rate of variously trimmed and positioned seednuts of coconuts, six different treatments were used.

The seednuts were positioned horizontally and vertically, and various sections of exocarp and mesocarp were trimmed away.

There were significant differences in both the trimming and positioning treatments with horizontal placement being superior to vertical and partial removal of exocarp showing an improvement in plant germination and growth.

INTRODUCTION

WITH the increasing use of polythene bags for coconut nursery planting in the British Solomons there was a need to revise planting methods. Nuts planted in the usual (horizontal) position were too big for the standard size polybags used in oil palm nurseries which are about 10 inches in diameter.

EXPERIMENTAL METHODS AND RESULTS

Malayan Tall seednuts were hand harvested to ensure uniformity of maturity. These were placed in eight replicates of six treatments with 30 nuts for each plot in the pre-nursery, from which 20 seedlings were selected for each plot in the nursery proper.

In the pre-nursery the nuts were covered lightly with coconut fronds to improve moisture retention, as is the normal practice in the British Solomons.

The nursery soil was a deep well-drained clay loam rich in humus and relying on rainfall for moisture throughout the experiment (November, 1968 to July, 1969). Positioning and trimming treatments were as follows: (see also *Figure 1*).

- | | |
|------------|---|
| Horizontal | (a) Whole nut, horizontal. |
| | (b) Exocarp (thin outer layer) removed from the lower half, horizontal. |
| | (c) As for (b) with mesocarp (fibrous bulk of husk) also removed from lower half exposing the shell. |
| | (d) A portion of the exocarp and one to two cm thickness of the mesocarp removed from over the germ pore; lower side untrimmed; horizontal. |
| Vertical | (e) Untrimmed, vertical. |
| | (f) Mesocarp removed from the lower half, vertical. |

A dry day is defined as one with less than 0.1 inch of rainfall, which would be less than half the normal evapo-transpiration occurring in Yandina conditions. A dry period (*Table 1*) is a series of such days, over which there would be appreciable drying out of the soil.

Germination was recorded at two week intervals from seednut harvest to eight weeks and is shown as percentages in *Table 2*.

Only horizontal nuts with some husk removed from over the germ pore (Treatment D) germinated faster than Treatment (A). This effect would have been due at least in part to the shoot being visible earlier in Treatment (D).

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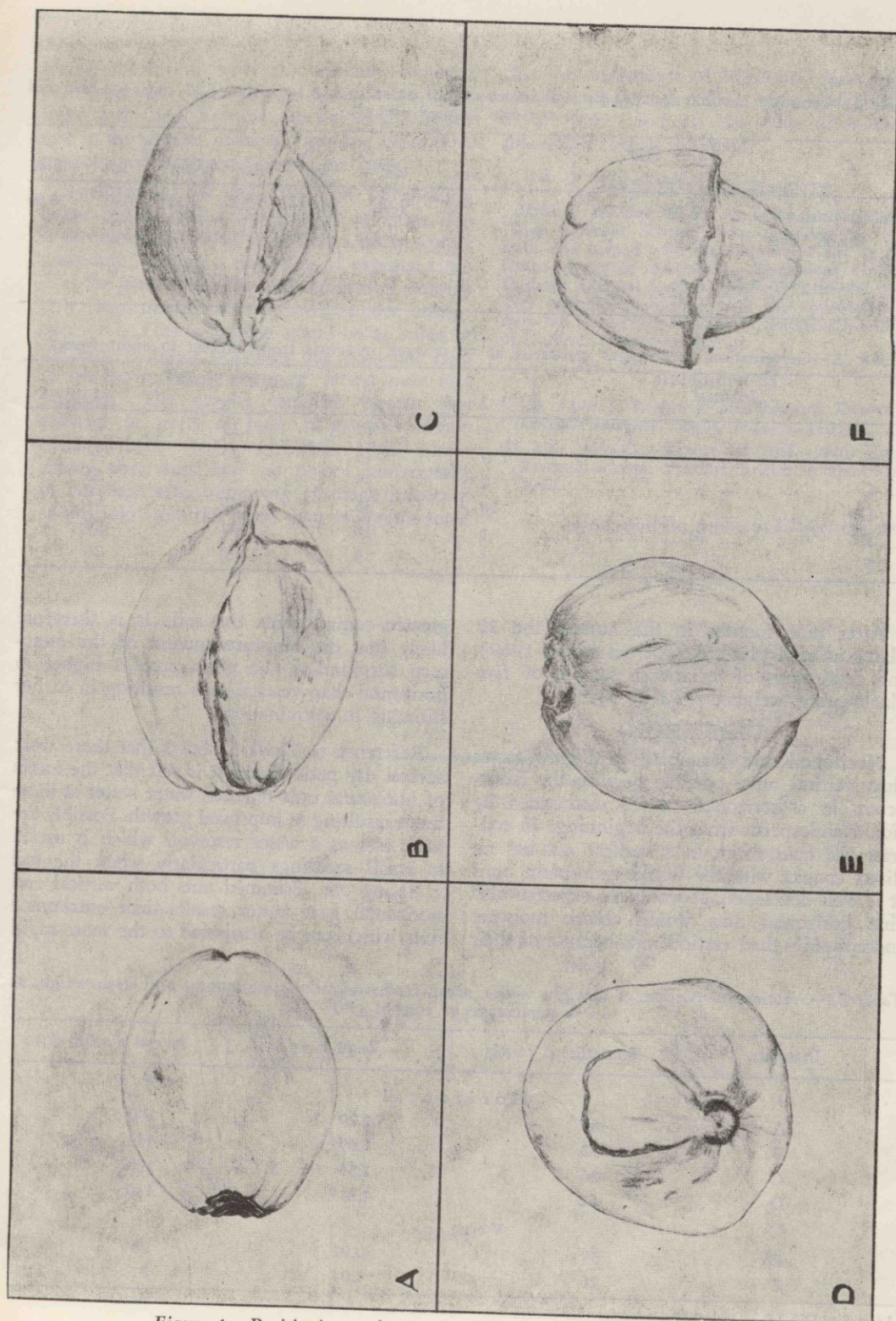


Figure 1.—Positioning and trimming treatments: see text for details

Table 1.—Monthly rainfall and dry periods in which not more than 0.10 inches (2.5 mm) of rain fell in any one 24-hour period

	1968		1969							
	Nov.	Dec.	Jan.	Feb.	Mar.	Apl	May	June	July	TOTAL
Rainfall (inches)	6.23	7.29	12.36	7.92	9.61	14.04	2.37	4.51	6.62	70.95
Dry period over 7 days	2	0	0	0	0	0	1	1	1	5
Dry period over 5-7 days	0	1	1	1	1	0	2	0	0	6

Table 2.—Germination percentages measured at two week intervals from harvest to eight weeks

Treatment						Weeks from Harvest			
						2	4	6	8
A	....	....	....	....	....	1	17	33	47
B	....	....	....	....	....	0	13	25	32
C	....	....	....	....	....	0	9	17	26
D	....	....	....	....	....	19	35	49	62
E	....	....	....	....	....	1	10	21	39
F	....	....	....	....	....	1	9	14	26

After nine months in the nursery the 20 plants in each plot were cut out (July, 1969) and fresh tops of a random sample of five plants were weighed (Table 3).

DISCUSSION

Horizontal nuts germinated and grew faster than vertical nuts, possibly because the haustorium in a horizontal nut is surrounded by liquid endosperm from the beginning. In contrast the haustorium in a vertical nut has no direct contact with the liquid endosperm until it is well developed. It would be expected also that horizontal nuts would absorb moisture more rapidly than vertical nuts because of their

greater contact with the soil. It is therefore likely that the moisture content of the mesocarp surrounding the germ pore is higher in horizontal than vertical nuts resulting in earlier stimulus to germination.

Reference to Table 1 shows that there were several dry periods and it is felt that the husks of horizontal nuts retained water better at these times resulting in improved growth. Possibly the husk acts as a water reservoir which is useful to small seedlings particularly when the soil is drying out. Trimmed nuts both vertical and horizontal gave better results than untrimmed nuts which can be attributed to the more rapid

Table 3.—Germination percentage at eight weeks, mean fresh weight at nine months and fresh weight as a percentage of control (A)

Treatments	Germination at 8 weeks	Weight in kg	Per cent of weight of A
Horizontal			
A	47	1.29	100
B	32	1.69*	131
C	26	1.55	120
D	62	1.81*	140
Vertical			
E	39	0.92	70
F	26	1.05	81

Least Sig. Diff ($P=0.05$) 0.39

*Significantly different from A at $P=0.05$

water absorption with the exocarp removed and freer movement of the roots through the husk to the soil. Vertical nuts have a disadvantage in the greater distance from the germ pore to point of emergence from the husk.

Treatments (D) and (B) gave significantly better results and a combination of these two is recommended. This would be a fairly simple procedure; cutting a thin slice of exocarp from over the germ pore (D) and removal of exocarp only from underneath to facilitate root emergence (B). This treatment would be of value in nurseries without polybags but does not help to overcome the problem of fitting nuts into polybags. The results establish clearly that removal of parts of husk is generally beneficial. Further trials (J.C.R.S. 1969) have shown that nuts may be placed horizontally in polybags after removing as much mesocarp as possible from the distal end. It is considered

that the advantages of horizontal nuts demonstrated in this trial and by other workers (e.g., C.I.B. 1962) indicate the value of horizontal placement even in polybags.

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