GERMINATION STUDY ON CALAMUS HOLLRUNGII BECC. SEEDS IN PAPUA NEW GUINEA

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by

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GERMINATION STUDY ON *Calamus hollrungii* Becc. SEEDS IN PAPUA NEW GUINEA

I. Effect of Hilar Removal on the Germination of Seeds using Top Soil and River Sand.

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Introduction

Rattan, a minor forest product, is an abundant and important product for rural communities where it finds many end uses. Rattan is a source of income for the rural communities throughout Papua New Guinea where it is used to manufacture furniture, artifacts, baskets etc. for sale locally at present. In Papua New Guinea, rattan canes have been harvested and exported to mainly Singapore and Malaysia at an alarming rate since the mid 1980s and this will continue to increase into the 1990s. At present there are no commercially grown rattan plantations in Papua New Guinea, all the cane harvested are from the natural forests where the resource is still abundant. Though much has been done in the past concerning the study of rattan resources (Zieck 1979), no study has been done on rattan seed germination. But similar trials have been conducted in Bangkok, Thailand (Sumatakun 1989).

Results obtained from these trials will be valuable for the future establishment of rattan arboreta and plantations. This preliminary study was conducted to evaluate a suitable media for germination and to find the effect of hilar removal on seed germination in top soil and river sand media.

Materials and Method

Two hundred seeds of *C. hollrungii* were obtained from seeds collected from the Bukawa area about 70 kilometres east of Lae. These were obtained by climbing the tree and cutting off the bunch using a bush knife. The seeds were removed from the bunch upon arrival at the laboratory and then selected by a floating viability test which was conducted by putting all the seeds into a sink full of water. Seeds that floated were discarded. The selected seeds had their pericarp and flesh removed the same day. They were divided into two equal batches and placed into two 500 ml beakers. The seeds were placed under running water for 48 hours. They were then removed and prepared for sowing. Fifty seeds, each with and without hilar, were sown in trays of top soil and river sand.

These were kept at the glass house and maintained by watering twice daily. The main objective of having the hilar removed is to enable the water and moisture to be accessible to the seed embryo so as to enable a faster germination. Germination of seeds from the two medium were monitored on weekly basis and the percentage of germination seeds were assessed for both seeds with and without the hilar.

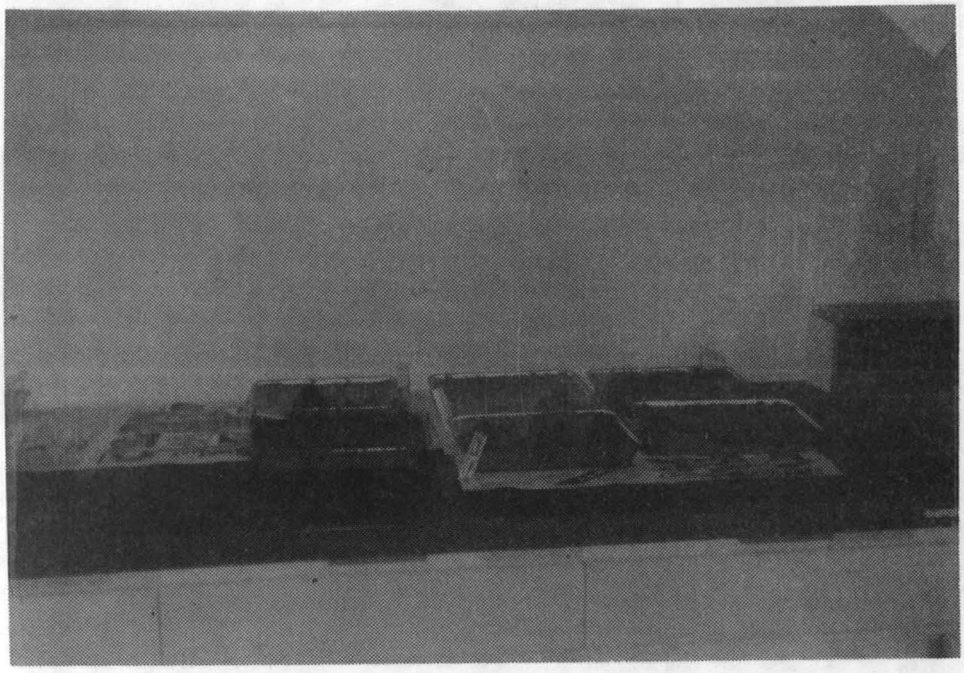

Figure 1 : Seed trays with top soil river sand

Results and Discussion

The results of germination trials of C. hollrungii seeds in top soil and river sand are shown in Table 1 and presented graphically in Figure 3.

Calamus hollrungii, showed good germination in both test media. A high percentage of seeds germinated very well, especially in the river sand. Although germination of seeds in both media started during the fourth week after sowing, the majority of seed germinated during the 5th and 6th week.

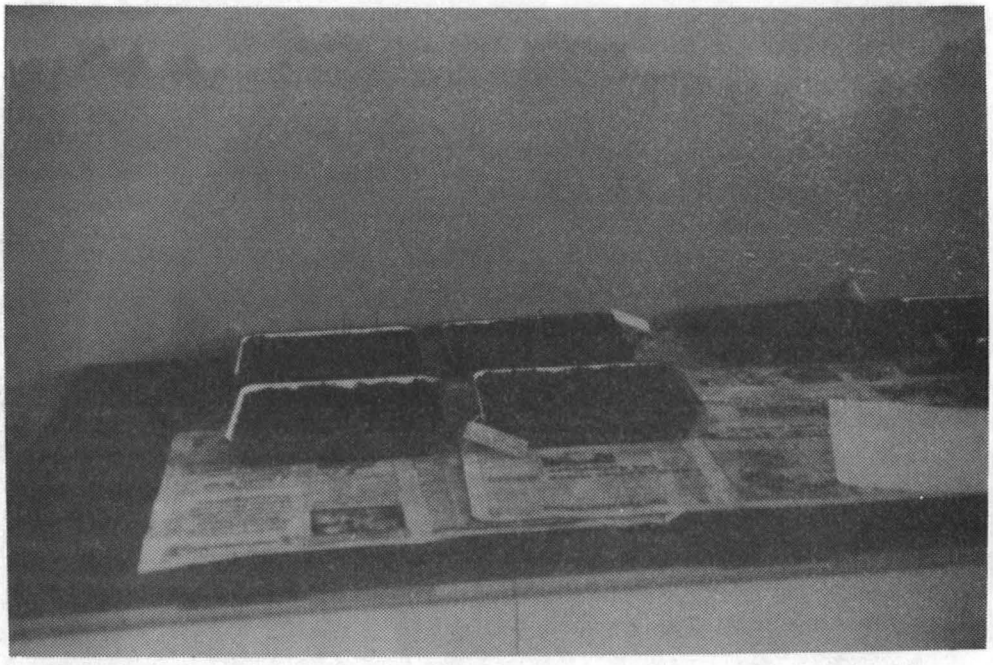

Figure 2 : Two weeks old germinated seeds

The removal of hilar from seeds did not show any significant differences on their germinations as shown in Table 1. In top soil 90% of the seeds without hilar germinated compared with 96% of those with hilar while in river sand, 80% of the seeds without hilar germinated compared with 88% of those with hilar. The slightly lower germination shown by seeds germinated without hilar may be due to poor hilar removal technique, causing damage to seed embryo.

Furthermore, although both germination media showed good germination, top soil had a slightly higher rate of germination. In comparison, 96% of seeds with hilar germinated in top soil while

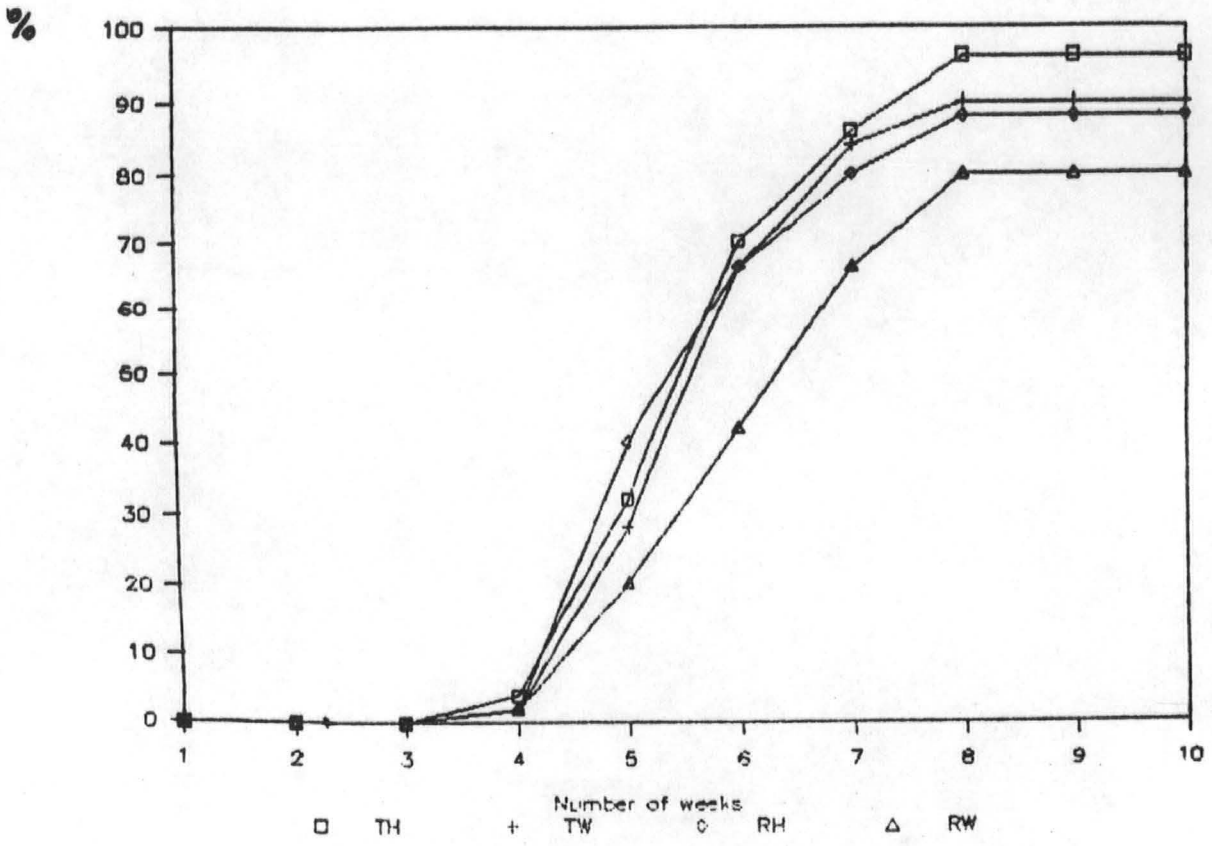

Figure 3 : Percentage of seeds germinated in top soil and river sand

CONCLUSION

From these preliminary results, the following conclusions can be made.

1. Seed of C. hollrungii germinates after three weeks of sowing.

2. Removal of seed hilar does not increase germination rate.

3. River sand, despite its poor nutrient source and water holding capacity, is relatively suitable for germinating seeds.

REFERENCE

Sumantakul, V. (1989) Preliminary studies on the seed germination of C. latifolius Roxb and C. longisetus Griff.
In : Proceedings of Rattan Seminar, Chiangmai, Thailand.

Zieck J.F.U. (1979) Rattan Inventory of Veikabu.

88% of these seeds germinated in river sand. And 90% of seeds without hilar germinated in top soil while 80% of these seeds germinated in river sand. These differences may be due to the nutrients available. Whereas top soil is able to hold nutrients with water, river sand is unable to do so. This means that top soil will be preferred to river sand in future germination trials if both soil types are readily available.

Table 1 : Number of seeds germinated weekly in top soil and river sand.

Week	TH		TW		RH		RW	
1	-	(0)*	-	(0)	-	(0)	-	(0)
2	-	(0)	-	(0)	-	(0)	-	(0)
3	-	(0)	-	(0)	-	(0)	-	(0)
4	2	(4)	1	(2)	1	(2)	1	(2)
5	14	(28)	13	(26)	19	(38)	9	(18)
6	19	(38)	19	(38)	13	(26)	11	(22)
7	8	(16)	9	(18)	7	(14)	12	(24)
8	5	(10)	3	(6)	4	(8)	7	(14)
9	-	(0)	-	(0)	-	(0)	-	(0)
10	-	(0)	-	(0)	-	(0)	-	(0)
Total	48	(96)	45	(90)	44	(88)	40	(80)

* Figures in brackets are germination percentage of seeds.

TH - Topsoil with Hilar
TW - Topsoil without Hilar
RH - Riversand with Hilar
RW - Riversand without Hilar

Table 2 : Cumulative numbers and germination percentage of seeds weekly.

Week	TH		TW		RH		RW	
1	0	(0)	0	(0)	0	(0)	0	(0)
2	0	(0)	0	(0)	0	(0)	0	(0)
3	0	(0)	0	(0)	0	(0)	0	(0)
4	2	(4)	1	(2)	1	(2)	1	(2)
5	16	(32)	14	(28)	20	(40)	10	(20)
6	35	(70)	33	(66)	33	(66)	21	(42)
7	43	(86)	42	(84)	40	(80)	33	(66)
8	48	(96)	45	(90)	44	(88)	40	(80)
9	48	(96)	45	(90)	44	(88)	40	(80)
10	48	(96)	45	(90)	44	(88)	40	(80)