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## Plantation Technique for *Calamus subinermis*: Comparison of Bare Root against Big and Small Polybags Plantation

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### Introduction

According to a former experiment on *Calamus caesioides* (ICSB/CIRAD-Foret Steering Committee Report, 1997) the size of the polybag has a large influence on the subsequent performance of the plants in the field. That was however a preliminary experiment, with a small number of plants. Furthermore, larger polybags are more difficult to manipulate, so that the suggestion to increase their size can not be implemented in the field without bringing along supplementary costs for their transportation.

The experiment presented here was aimed to study more precisely the effect of the nursery techniques on another rattan species of interest, *C. subinermis*. At the same time, in order to find a solution to the difficulties linked to the manipulation of the heaviest polybags, we wanted to see if it is possible to raise the seedlings in large polybags but to plant them bare roots (discarding in such a way the weight of the soil).

### Material and Methods

The experiment was a split-plot with two factors and repeated thrice. The factors and their corresponding treatments were:

Factors (code)	Treatments (code)	Number of plants
Polybag size (1)	15' x 10' (1)	24
	6' x 9' (2)	24
Planting method (2)	With soil (1)	24
	Bare roots (2)	24

This experiment was prepared in the PISP nursery. To check if the conditions there was similar or not to those of the main nursery, we added to the experiment a control from this latter, consisting of 24 plants of the same age, raised in 6' x 9' polybags and distributed over the three repetitions. The trial was planted on January 1997, and assessed twice, the first time just after

planting, and later in August 1997. The measured character was the total height of the plants, obtained by adding the height of all the stems within a clump.

A preliminary analysis of the first assessment showed that there were not significant differences among treatments at the time of the establishment, except from the fact that the larger polybags accelerated slightly the growth; this effect was however part of the experiment and was accounted for in the split-plot scheme.

The trial analysis was carried out according to the split-plot technique, with the treatments niched within the factors. The plants prepared in the PISP nursery with 6' x 9' polybag and planted with soil (2-1) were compared to the control from the main nursery in a separate analysis of variance.

## Results

This experiment showed that the larger polybags were doing significantly better than smaller ones, and that planting with soil was significantly better than planting bare root plants (Table 1). There was not any block effect; by contrast, the polybag size, the planting method and their interaction effects were all significant.

**Table 1. Statistical analysis of the split-plot scheme. Dependent variable: total height.**

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	7	6360.699	908.671	38.64	0.0001
Error	82	1928.289	23.515		
BLOCK	2	34.032	17.016	0.72	0.4881
POLYBAG	1	723.533	723.533	27.94	0.0340
PLANTING METH	1	4628.123	4628.123	196.81	0.0001
POLYB*PLAN METH	1	708.677	708.677	30.14	0.0001

In spite of the quite obvious results of above, it was however interesting to observe the quite large differences (always highly significant) among treatments (Table 2). The plants raised in large polybags and planted bare roots also suffered a 25% of mortality, while in all the other treatment the mortality was zero.

**Table 2. Number of trees, average and standard deviation for the total height (cm) within treatments.**

Polybag	Planting method	N	Mean	SD
10' x 15'	<i>With soil</i>	24	30.46	5.48
10' x 15'	<i>Bare roots</i>	18	10.33	4.35
6' x 9'	<i>With soil</i>	24	19.04	4.45
6' x 9'	<i>Bare roots</i>	24	10.20	4.91

By contrast, we did not observe any differences among seedlings raised in a similar way (small polybags planted with soil) in the main nursery (height=20.41) and in the PISP nursery (height=19.04; data not shown).

## **Discussion and Conclusion**

One minor finding of the experiment was that there were no differences among plants raised in the PISP nursery and in the main nursery. This proves that the results obtained in the PISP can be applied in the main nursery straight away.

It is still early to make the final conclusion about this trial. Of course the best result obtained with large polybags and plantation with soil suggests that this material should be the preferred one. However their weight makes their handling impossible at the commercial planting scale. Because at seven months after planting the results obtained by bare root plantation was bad enough to discourage the use of this technique, the best present alternative remain to plant small polybags with soil. This experiment however encourage once again to find better performing polybags, and we plan to study in the near future the use of "root trainers" polybags