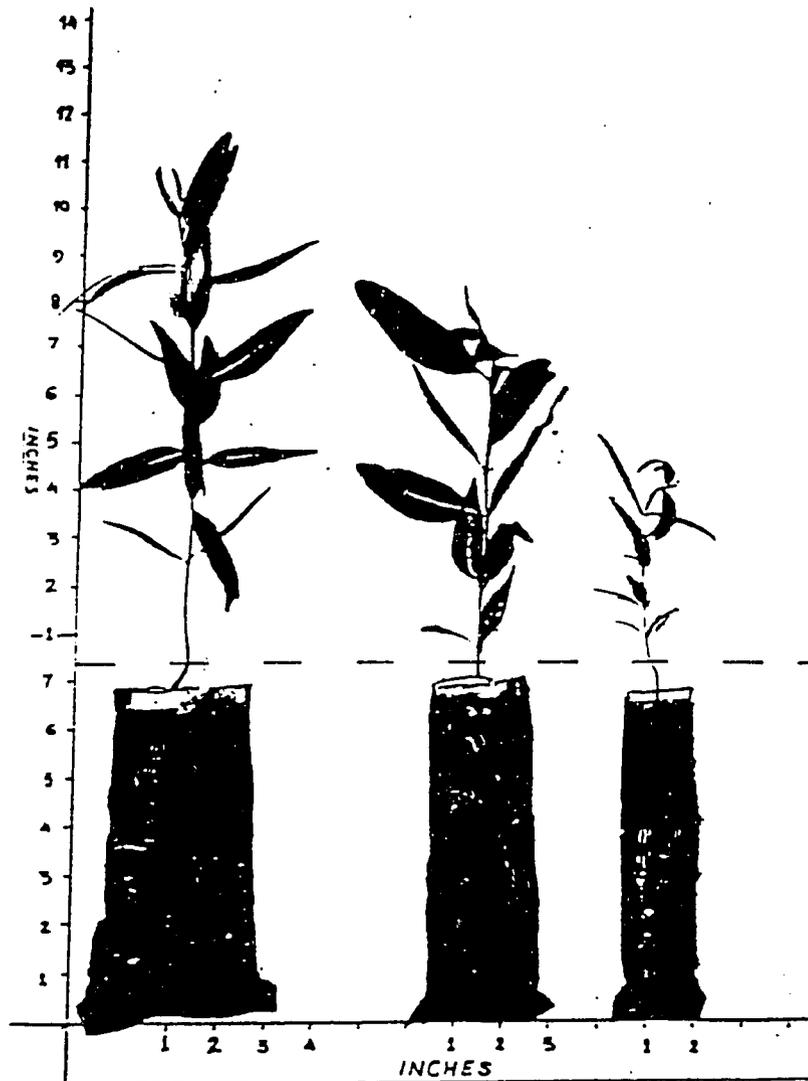




FORESTRY PLANNING & DEVELOPMENT PROJECT

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THE EFFECTS OF THREE DIFFERENT SIZED POLYTHENE TUBES ON Eucalyptus camaldulensis SEEDLING DEVELOPMENT



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INTRODUCTION

A polythene tube 4 inches in diameter and 8 inches in length is generally used in farm forest nurseries to raise tree seedlings. However, increasing pressure on field forest officers to meet reforestation targets has resulted in them experimenting with the use of polythene tubes of smaller sizes so greater numbers of seedlings can be raised in the same farm nurseries. These trials have generally followed the growing regime associated with the larger tube.

During the Spring of 1991 a controlled experiment was undertaken at the Khaliqdad forest nursery, Attock District, Punjab to test the effects of three different sized polythene tube on the development of Eucalyptus camaldulensis seedlings.

METHODS AND DESIGN

Polythene tubes 2 inches in diameter and 7 inches in length (2" x 7"), 3 inches in diameter and 8 inches in length (3" x 8"), and 4 inches in diameter and 8 inches in length (4" x 8") were filled with a sandy loam nursery soil. Three hundred tubes of each size were used to layout a randomized complete block experiment. One month old Eucalyptus camaldulensis seedlings of the same seed source were pricked into the polythene tubes on 22 March 1991. The following management regime was used to raise the seedlings:

Shading: Pricked out seedlings were placed under the shade of a tree

Watering: By rose can twice a day for 7 days and subsequently only once a day:

Height measurements in inches were taken 97 days (28 July 1991) following pricking out, on seedlings in 20 tubes randomly selected from each treatment and block. At 129 days (29 August 1991) following pricking out, height measurements in inches were repeated on a second set of randomly selected seedlings. Analysis of variance and Newman-Keuls multiple range test were used to analyze these data. Photographs were taken of representative seedlings in each type of polythene tube on day 97.

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RESULTS

Figure 1 graphically shows the differences in the average total height of the seedlings for each of the three tube sizes at the end of 97 and 129 days. As shown in Table 1, there was no significant difference in total height of seedlings raised in the two larger tubes. The total height of the seedlings raised in the smallest tube is significantly less at both times. Furthermore, the average rate of height growth of the seedlings in the smallest tube during the last 32 days is also significantly less than the rate of height growth of the seedlings in the larger tubes (Table 2).

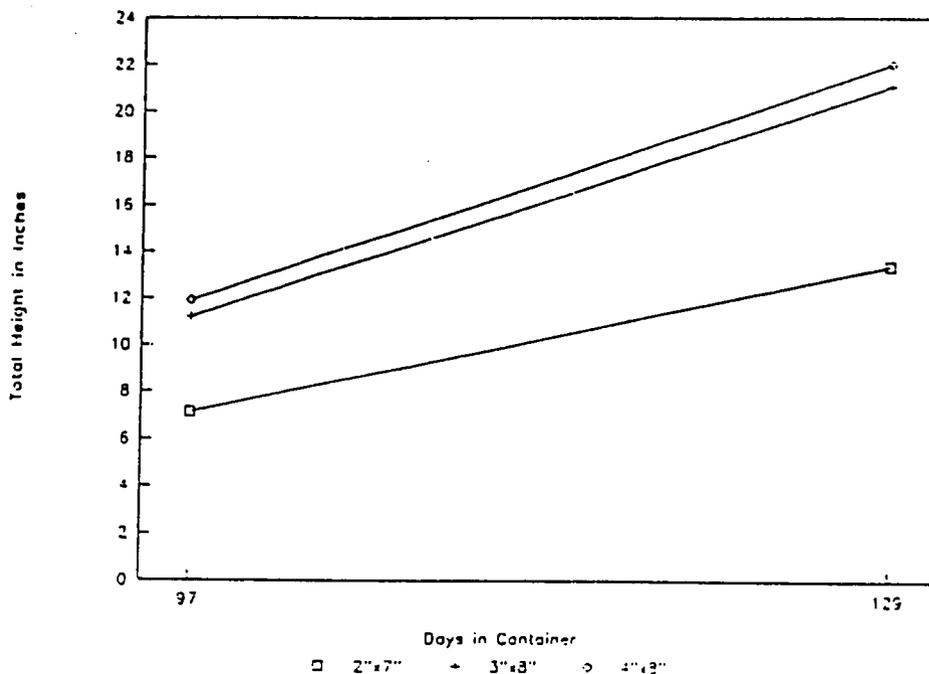


Figure 1. Average seedling height by tube size and date of measurement.

Table 1. Seedling height differences by polythene tube size on day 97.

a. Analysis of Variance

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square	F
Due to Blocks	2	3.48	1.740	3.59 ns
Due to Treatment	2	40.23	20.115	41.47 sig
Error		4	1.94	0.485
Total		8	45.65	

b. Treatment Differences in inches

Average seedling height in tubes of size		
2" x 7"	3" x 8"	4" x 8"
7.1	11.2	11.9

Table 2. Seedling height growth rate differences between day 97 and day 129 by polythene type size.

a. Analysis of Variance

<u>Source of Variation</u>	<u>Degrees of Freedom</u>	<u>Sum of Squares</u>	<u>Mean Square</u>	<u>F</u>
Due to Blocks	2	15.53	7.765	6.93 ns
Due to Treatment	2	27.33	13.665	12.20 sig
Error	4	4.48	4.48	1.120
Total	8	47.34		

b. Treatment Differences in inches

Average total seedling height growth between day 97 and 129 in tubes of size

2" x 7"	3" x 8"	4" x 8"
6.3	9.9	10.1

Figure 2 visually illustrates the differences in physical appearance of representative seedlings from each type of polythene tube on day 97.

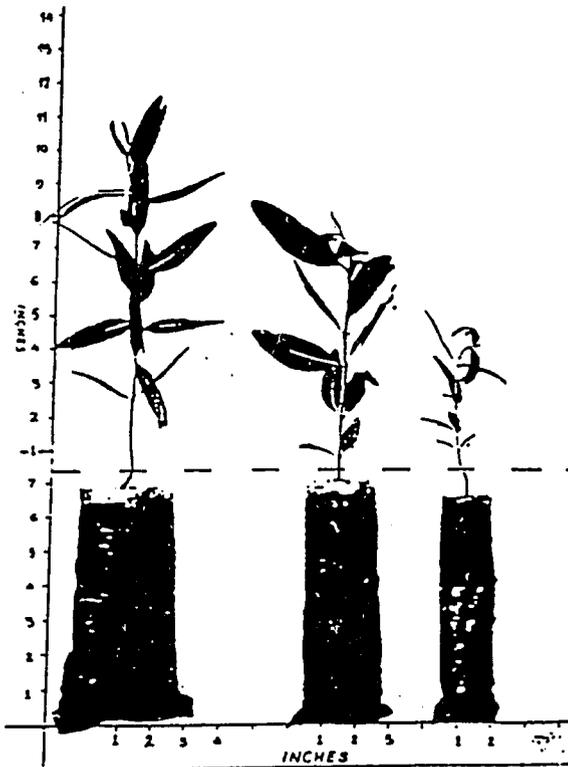


Figure 2. Physical appearance of representative seedlings from each size of tube on day 97.

DISCUSSION AND CONCLUSIONS

Although there was no statistical difference in total height of seedlings in the two larger tubes, the seedlings in the 4" x 8" tube appeared more vigorous, more healthy and more sturdy. These differences are also reflected in the appearance of the representative seedlings shown in Figure 2. Furthermore, these characteristics are more important than height in insuring the success of plants in the field.

Better results suggest that 4" x 8" polythene tubes produce a Eucalyptus camaldulensis seedling under the nursery management regime that is commonly used in farm nurseries. Until nursery management regimes are developed for smaller polythene tubes, increased seedling production targets are best met by increasing the number or size of farm forestry nurseries and not by reducing polythene tube size.