



Research Article



Effect of potting mixture on growth and development of quality planting material of *Bambusa balcooa*.

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ABSTRACT

An experiment was conducted to find a suitable pot mixture for improving the vigor of the saplings in *Bambusa balcooa*. Pot mixture containing garden soil + FYM in 1:1 ratio recorded the maximum seedling height (93.75 cm), number of branches (3.25), base diameter (7.50 mm), no. of internode (8), internode distance (11.25 cm) and weight of tiller (119.50 gm)

Keywords: Bamboo, *Bambusa balcooa*, neemcake, poultry manure and Vermicompost.

INTRODUCTION

Bamboo is one of the important forest species used in paper industry, house construction, ornaments making etc. Most of the bamboo species are propagated both by seeds and vegetative means. *Bambusa balcooa* is mainly multiplied by seeds, culms, rhizomes etc. The seedlings in the nursery usually vary in vigor and other growth characters. Therefore, production of good quality seedlings is an important step for ensuring uniform plantation. Seedling quality can be improved

Nursery through utilizing proper container and media mixture. Many researchers reported the increased seed germination (Bahuguna *et. al.*, 1989; Vanangamudi *et. al.*, 1993; Biradar *et. al.*, 1998) and seedling vigor (Maronek *et. al.*, 1980; Young, 1990) in the forest species due to the use of the nursery mixture. However, the information on use of the nursery mixture with suitable organics for *Bambusa balcooa* is limited. Hence, the present study was aimed to find out the suitable nursery mixture for the production of more offsets for vegetative propagation or forest planting through seed propagation in *Bambusa balcooa* species.

MATERIALS AND METHODS

The nursery pot mixtures were prepared by using different media and manure as per the following details. The Treatments are T₁- Garden soil alone; T₂- garden soil + Cocopit (1:1); T₃- garden soil + FYM (1:1); T₄- garden soil + Vermicompost (1:1), T₅- cocopit + FYM (1:1), T₆- garden soil + neem cake (1:1), T₇- garden soil + poultry manure (1:1), The different nursery mixtures were filled separately in the polythene bags (8 x 12 Inch) in four replications comprising of 25 bags in each

replication by following the completely randomized design. The bamboo saplings having a height 25 cm are planted in polythene bags filled with different potting mixtures and watered regularly for the proper growth of saplings. The survival per cent and other growth characteristics were recorded six months after planting. The data were analyzed using the statistical method described by Panse and Sukhatme (1967) and the critical difference values were calculated at 5% probability level.

RESULTS AND DISCUSSION

The saplings in the nursery will vary in vigour and other growth characters. It is important that only vigorous seedlings are selected for planting (Farooqi and Sreeramu, 1999). The vigour of the saplings is highly influenced by the nursery pot mixtures. In the present investigation, the results showed that the treatment T₃ recorded significantly maximum height (93.75 cm) of tillers in potting mixture of garden soil + FYM (1:1) as compared to other treatment. It was followed by treatment T₄ (garden soil + Vermicompost (1:1). Whereas, lowest height (38.75 cm) of tillers was recorded in garden soil + cocopit potting mixture (1:1). Similar results of pot mixture containing soil: sand: Vermicompost / soil: sand: goat manure gave higher germination and vigorous seedlings in *Albizia lebbek* (Natarajan, 1999) and arecanut (Raja *et al.*, 2002). Raja *et. al.*, (2012) also recorded maximum height of *Bambusa tulda* saplings in soil + sand + Vermicompost potting mixture (2:1:1).

Table: 1. Growth characteristics of *Bambusa balcooa* saplings in different potting

Treatments	Initial sapling height (cm)	Height of tiller (cm)	No. of branches	Base diameter (mm)	No. of internode	Internode length (cm)	New tillers	Total no. of tillers	Weight of tiller (gm)
Garden soil (100 %)	25	52.00	1.00	4.00	6.75	7.50	0.00	1.00	24.56
Garden soil + Cocopit (1:1)	25	38.75	1.00	2.50	4.50	4.75	1.00	2.00	17.75
Garden soil + FYM (1:1)	25	93.75	3.25	7.50	8.00	11.25	1.00	1.75	119.50
Garden soil + Vermicompost (1:1)	25	80.00	1.75	5.75	7.75	9.75	0.75	1.75	63.75
Cocopit + FYM (1:1)	25	48.75	2.00	3.25	6.00	8.00	1.75	2.75	50.50
Garden soil + Neemcake (1:1)	25	44.00	2.00	2.75	5.50	7.75	1.25	2.50	33.75
Garden soil + Poultry manure (1:1)	25	57.75	2.00	4.25	7.00	9.50	1.00	2.00	39.75
F test		Sig	Sig	Sig	Sig	NS	NS	NS	Sig
SE +		3.11	0.30	0.59	0.66	1.28	0.41	0.45	4.36
CD @ 5%		9.31	0.89	1.78	1.98	--	--	--	13.07

Significantly maximum number of branches was recorded in treatment T₃ (3.25) in comparison to other treatments. The base diameter was high (7.50) in the treatment T₃ (garden soil + Vermicompost (1:1)). The next best treatment viz., T₄ (garden soil + Vermicompost (1:1)) produced 5.75 number of branches which had no significant difference with previous treatment. Garden soil + cocpit (2.50) and garden soil + neemcake (2.75) recorded minimum number of branches during six months after transplanting of tiller (table1). Among the treatments, the maximum number of internode per tiller (8.00) and internode distance (11.25 cm) was recorded in treatment T₃ (garden soil + Vermicompost (1:1)) These characters was least recorded in treatment (T₂ : Garden + cocpit (1:1), respectively). No significant difference was observed in regards with new tillers and total number of tillers amongst the different treatments. Significantly maximum weight of tillers (119.50 gm) was reported in treatment T₃ (garden soil + FYM (1:1)). It was followed by treatment T₄ (garden soil + Vermicompost (1:1)). Whereas, lowest weight of tiller (17.75 gm) was reported in potting mixture of garden soil + cocopit (1:1). The significant growth characteristics viz., height of tillers (cm), number of branches, base diameter (mm), number of internodes, internodal length and weight of tillers was recorded maximum in potting mixture contacting garden soil with FYM and Vermicompost. Sreekrishna Bhat, (1999) found that the vermicompost acts as a good pot mixture because it contains rich nitrogen (1.5-2.5%), phosphorus (0.9-1.7%), potassium (1.5-2.4%), Magnesium (0.2-0.3%), calcium (0.5-1.0%), sulphur (0.4-0.5%) and vitamins. It also has growth hormones like gibberellins, which regulate the plant growth. It can supply full requirement of micronutrients and enhances the availability of both native and added micronutrients in soil (Purakayastha and Bhatnagar, 1997). The farmyard manure has 0.5 % nitrogen, 0.2% phosphorous and 0.5 % potassium which are slightly higher in poultry

manure (3.03% N, 2.63% P, and 1.4 % K) (Sankaranarayanan, 2004). This might be the reason for enhanced performance in bamboo seedlings. The increased nutrient level in poultry manure might be the cause of the seedling vigour improvement in the bamboo after the Vermicompost treatment. The Vermicompost has the additional nutrients and vitamins other than nitrogen, phosphorous and potassium which showed positive effect on the seedling vigour. The other treatments including cocpit, neemcake had no significant effect on the performance of the seedlings.

**Fig 1. Effect of the potting mixture on tillers of bamboo**

CONCLUSION

It is concluded that the pot mixture comprising of soil + FYM (1:1) have recorded the maximum height of tiller, number of branches, base diameter, number of internode, internodal length and weight of tiller. Therefore, this pot mixture can be recommended for getting the vigorous seedlings through saplings propagation. Maximum number of offsets produced can also be separated for further vegetative propagation or planting.

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CONFLICT OF INTEREST

The author here declares that there is no conflict of interest in the publication of this article.

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