

Cost analysis of production of *Dendrocalamus strictus* seedlings through integrated nutrient management treatments

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ABSTRACT

An experiment was carried out for the cost analysis of production of bamboo, *Dendrocalamus strictus* seedlings through integrated nutrient management treatments under nursery condition. N, P_2O_5 and K_2O (2.0, 1.25, 1.25; 1.5, 0.938, 0.938; 1.0, 0.625, 0.625 g/kg of soil) applied as urea, single super phosphate and muriate of potash along with FYM (500 g) and biofertilizers viz VAM and *Azospirillum* applied @ 40 and 20 g/kg of soil respectively were evaluated with the unfertilized soil (control). The results revealed that integration of 1.5 g N, 0.938 g of P_2O_5 and 0.938 g of K_2O with 500 g FYM, 40 g VAM and 20 g *Azospirillum* per kg of soil recorded the best growth of seedlings and the nursery period was reduced by 53 days. For this treatment the cost of fertilizer for 1000 seedlings was worked out to be ₹1,909.95 and a reduction in nursery days of 67 days was achieved over control.

Keywords: *Dendrocalamus strictus*; bio-fertilizers; VAM; FYM; *Azospirillum*

INTRODUCTION

Bamboo, *Dendrocalamus strictus* is a wonderful gift of nature. Bamboo species are giant, woody tree like grasses, have a long history and widely used as renewable bioresource. The range of uses of bamboo for humans is remarkable with an estimated annual use of 12 kg of bamboo produce per capita in Asia (Recht and

Wetterwald 1988). The plethora of its uses in the human economy has led to the coinage of a variety of names for this superb species. The Vietnamese call it 'My Brother', the Chinese 'Friend of the People' and in India it is widely known as 'Green Gold' or 'Poorman's Timber'. Bamboo is a tall arborescent grass belonging to the family Bambusae, a tribe of Poaceae (Gramineae) indigenously found in all the

continents except Europe. It is reported that over 75 genera and 1,250 species of bamboos occur in the world whereas 43 species belonging to 14 genera are found in Africa.

MATERIAL and METHODS

The experiment was laid out in completely randomized design (CRD) given by Snedecor and Cochran (1967) with five treatments and five replications at College of Forestry and Environment of Allahabad Agricultural Institute—Deemed University, Allahabad, Uttar Pradesh.

Following treatments were used per kg soil of pot mixture:

T ₁	Control
T ₂	2 g N, 1.25 g P ₂ O ₅ and 1.25 g K ₂ O
T ₃	2 g N, 1.25 g P ₂ O ₅ and 1.25 g K ₂ O + 500 g FYM + 40 g VAM + 20 g <i>Azospirillum</i>
T ₄	1.5 g N, 0.938 P ₂ O ₅ and 0.938 K ₂ O + 500 g FYM + 40 g VAM + 20 g <i>Azospirillum</i>
T ₅	1 g N, 0.625 P ₂ O ₅ and 0.625 K ₂ O + 500 g FYM + 40 g VAM + 20 g <i>Azospirillum</i>

The polythene bags of size 25 x 20 cm were filled with two kg of soil. The bags were arranged in a completely randomized design with five replications @ 500 polythene bags per treatment per replication.

The seeds of bamboo were sown in mother bed size of 10 x 1 m. Healthy seedlings were transplanted uniformly @ one seedling per bag on 30th DAS. The irrigation and plant protection measures were given as per standard package of production for *D strictus*. The soil mixture of 2:1:1 (soil:sand:FYM) was used for polybags. The calculated quantity of biofertilizers (VAM and *Azospirillum*) was added to the respective polybags as per the treatment schedule at transplanting. The inorganic fertilizers were added as aqueous solution to each polybag seven days after transplanting. The seedlings height was recorded at 60, 90 and 120 days after transplanting (DAT) for fifty seedlings/ treatment/replication.

RESULTS and DISCUSSION

The data tabulated in Table 1 depict that application of 1.5 g N, 0.938 g of P₂O₅ and 0.938 g of K₂O integrated with 500 g FYM, 40 g VAM and 20 g *Azospirillum* per kg of soil (T₄) recorded the best growth and the nursery period was reduced by 53 days. For this treatment the cost of fertilizer for 1000 seedlings was worked out to be ₹1,909.95 and a reduction of 67 days was achieved over control.

In the present investigations application of 1.5 g N, 0.938 g of P₂O₅ and 0.938 g of K₂O per kg of soil along with 500 g FYM, 40 g VAM and 20 g *Azospirillum* per kg of soil (T₄) resulted

Table 1. Seedling height and production economics of *D strictus* (1000 seedlings) using integrated nutrient management treatments

Treatment	Seedling height (cm) at			Projected # of days for 28.83 cm growth	Watering		Shifting		Fertilizer cost (₹)	Total cost (₹)
	60 DAT	90 DAT	120 DAT		#	cost (₹)	#	cost (₹)		
T ₁	16.15	21.66	28.83	120	240	254.00	4	280.00	-	534.00
T ₂	19.45	26.13	37.07	93	186	158.10	3	210.00	19.75	387.80
T ₃	20.72	28.81	54.41	64	128	108.80	3	210.00	1684.75	2003.55
T ₄	25.81	31.73	65.67	53	106	90.10	2	140.00	1679.85	1909.95
T ₅	18.93	28.23	45.73	76	152	129.20	3	210.00	1674.90	2014.10

into healthy seedlings of 28.83 cm height in 53 days while a normal period of 120 days was required under natural conditions in the nursery. The cost of fertilizers for 1000 seedlings was worked out to be ₹1909.95. This was followed by the treatment 2 g of N, 1.25 g of P_2O_5 and 1.25 g of K_2O along with 500 g FYM, 40 g VAM and 20 g *Azospirillum* per kg of soil (T_3) which was achieved by reducing the nursery period to 62 days. This reduction might be due to the integrated application of nutrients and its availability in perpetuity.

The reduction of nursery period as well as maintenance cost by adopting fertilizer application was observed by Sundararaju and Chinnathurai (1990) in *Eucalyptus globules*, Sundararaju et al (1991) in *E. tereticornis* and *E. camaldulensis*, Saravanan (2000) in *Azadirachta indica*, Adalarasan (2002) in *Casuarina equisetifolia* and Matheshwaran (2006) in *Simarouba glauca*.

CONCLUSION

The results of the present study revealed that application of 1.5 g N, 0.938 g of P_2O_5 and 0.938 g of K_2O integrated with FYM (500 g), VAM (40 g) and *Azospirillum* (20 g) kg^{-2} of soil recorded

the best growth and the nursery period was reduced by 53 days. For this treatment, the cost of fertilizer for 1000 seedlings has been worked out to ₹1909.95 and a reduction of 67 days was achieved over control.

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