

Original Research Article

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## Study on Germination Percentage of Coffee (*Coffea arabica* cv. Chandragiri) Seeds Grown in Portray and Raised Bed using Different Rooting Media in Primary Nursery

D. D. Srigandha\*, J. Venkatesha and Sudeesh Kulkarni

Department of Plantation, Spices, Medicinal and Aromatic crops, College of Horticulture, Bagalkot, Udyanagiri (Karnataka) India

\*Corresponding author

### ABSTRACT

#### Keywords

Coffee, Protray, raised bed, Media

#### Article Info

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This study was conducted with an objective to find out the most suitable media for better germination of coffee seeds sown in portray and raised bed. Coffee seedlings were grown in portray and raised using 7 different media for a period of 45 days in primary nursery. It was revealed from the study that, the germination percentage of coffee seeds was greatly influenced by different media used. Coffee seeds sown in raised bed using the media red soil+ sand+ vermicompost (C1M3) recorded maximum germination percentage (61 and 87.80) at 30 and 45 days after sowing.

### Introduction

Coffee is the second important commodity in international trade, next to petroleum products in trade volume and value. Coffee (*Coffea* sp.) belongs to family Rubiaceae. As per 2019-20 data Karnataka leads in production (2,03,445 MT) next top producer states are Kerala and Tamilnadu (Anonymous, 2020). India exports 70-80 per cent of its produce. Commercially coffee is propagated through seeds. There are various factors that influence the initial development of coffee growing in the field, such as the seedlings production process and, specially, the container and substrate used (Vallone *et al.*, 2009). Regarding the

substrate, conventionally Forest soil: FYM: Sand (6:2:1) is used, but the availability of forest soil is difficult because of diminishing of forest area.

### Materials and Methods

An experiment was conducted during 2016-17 at the College of Horticulture, Mudigere to know the germination percentage of coffee seeds grown in portray and raised bed using different rooting media for large scale plantation programme. The required seeds were collected from Central Coffee Research Institute, Balehonnur. An experiment was laid out in a two factorial randomized block

design. Coffee cultivar Chandragiri was used. Seeds were sown in portrays, 2 seeds per well and raised bed of 15 cm height and 1 m wide

size at a distance of 2 cm between seeds and 10 cm between rows in primary nursery for a period of 45 days.

**Treatment detail**

Factor I: Container		Factor II: Media	
Treatment	Container	Treatment	Media
C <sub>1</sub>	Raised bed [Control]	M <sub>1</sub>	Red soil + sand + FYM in 3:1:1 ratio (Control)
C <sub>2</sub>	Protrays(2'' × 2'')	M <sub>2</sub>	Red soil + cocopeat + FYM in 3:1:1 ratio
		M <sub>3</sub>	Red soil + sand + vermicompost in 3:1:1
		M <sub>4</sub>	Red soil + sand + pressmud in 3:1:1
		M <sub>5</sub>	M <sub>1</sub> + <i>Pseudomonas fluorescens</i> (5g/ kg)
		M <sub>6</sub>	M <sub>5</sub> + VAM – <i>Gigaspora gigantean</i> (10g/kg FYM)
		M <sub>7</sub>	M <sub>5</sub> + PSB – <i>Bacillus megaterium</i> (10g/kg FYM) + Nitrifying Bacteria – <i>Azospirillum</i> (10g/kg FYM)

**Results and Discussion**

Germination percentage of coffee seeds found to be significant among the containers, media and with their interactions. The maximum germination percentage was found in the seeds sown in raised bed prepared by using red soil + sand+ vermicompost (C<sub>1</sub>M<sub>3</sub>) which was on par with C<sub>1</sub>M<sub>7</sub> i.e., raised bed

prepared by using Red soil + sand + FYM+ *Pseudomonas fluorescens* + PSB+ Nitrifying Bacteria and the least was recorded in C<sub>2</sub>M<sub>1</sub> at 30 days after sowing. Similarly at 45 days after sowing maximum germination was found in C<sub>1</sub>M<sub>3</sub> followed by C<sub>1</sub>M<sub>7</sub> and C<sub>1</sub>M<sub>6</sub> and the least was recorded in C<sub>2</sub>M<sub>1</sub> (Table 1 and 2).

**Table.1** Effect of portray, raised bed, rooting media and their interactions on germination percentage of coffee seeds at 30 days after sowing

	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	M <sub>4</sub>	M <sub>5</sub>	M <sub>6</sub>	M <sub>7</sub>	Mean
C <sub>1</sub>	41.50	45.80	61	51.50	56.40	59.40	59.80	53.62
C <sub>2</sub>	31.60	37.20	59.30	39.80	32.90	37.50	38.70	39.57
Mean	36.55	41.50	60.15	45.65	44.65	48.45	49.25	
	SEm±				CD @ 5%			
Container(C)	0.154				0.476			
Media(M)	0.288				0.884			
Interaction(C×M)	0.408				1.241			

**Table.2** Effect of portray, raised bed, rooting media and their interaction on germination percentage of coffee seeds at 45 days after sowing

	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	M <sub>4</sub>	M <sub>5</sub>	M <sub>6</sub>	M <sub>7</sub>	Mean
C <sub>1</sub>	65.60	70.90	87.80	75.40	81.40	82.80	83.40	<b>78.18</b>
C <sub>2</sub>	62.50	65.80	78.10	70.00	63.10	64.50	65.60	<b>67.08</b>
<b>Mean</b>	<b>64.05</b>	<b>68.35</b>	<b>82.95</b>	<b>72.70</b>	<b>72.25</b>	<b>73.65</b>	<b>74.50</b>	
	<b>SEm±</b>				<b>CD @ 5%</b>			
<b>Container(C)</b>	0.219				0.674			
<b>Media(M)</b>	0.410				1.259			
<b>Interaction(C×M)</b>	0.580				1.770			

C: Container

M: Media

This maximum germination could be attributed to the fact that well decomposed vermicompost maintains optimum moisture and in addition sand provides good aeration and oxygen for better respiration and red soil supports better anchorage, this integrated condition favours for better germination of seeds. Bhardwaj (2014) recorded highest percentage of germination (95.27) in papaya cv. Red lady in similar media of vermicompost: sand: pond soil (1:1:1) with cocopeat.

In portray surface area is less and drainage is inadequate whereas in raised bed ample surface area, better moisture availability and good aeration which facilitated better germination of seeds. Similar findings was recorded by Jabbar *et al.*, (2010) in *Albizia procera* which attained 95% germination within 14 days after sowing in traditional nursery bed.

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