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## Effect of potting media and polybag bag size for rebagging Karonda (*Carissa carandas*) grafts under Konkan Agroclimatic conditions

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### Abstract

The experiment entitled “Standardization of media and bag size for rebagging Karonda (*Carissa carandas*) grafts under Konkan Agroclimatic conditions” was carried out at college of Horticulture, Dapoli. Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli. Dist. Ratnagiri (Maharashtra) during 2020-21 and 2021-22. The objectives of studies were to find out the effect of potting media and to standardize bag size on survival and growth of karonda and laid out in Randomized Block Design. The experiment comprised of eleven treatments and replicated three times and revealed that in karonda from the pooled data of two seasons, the maximum survives (100.00%), highest plant height (49.04 cm), girth above union (6.36 mm), maximum number of leaves (49.88), number of shoots (7.03), number of nodes (6.25) was recorded in T<sub>11</sub>. The fastest absolute growth rate (0.0650 cm/day), relative growth rate (0.0099 cm/cm/day) was found in T<sub>5</sub>. The maximum fresh weight of grafts (76.67 g), longest length of root (38.73 cm), highest number of adventitious roots (27.67), dry weight of root (10.78 g) was recorded in treatment T<sub>11</sub> i.e., Bag size 10”×14” with media Soil + FYM+ Rice husk (1:1:1).

**Keywords:** Karonda, rebagging, potting media, polybag, survival and growth

### 1. Introduction

Karonda is suitable for growing throughout subtropical and tropical climatic zones of India. Major natural areas of occurrence of Karonda have been observed in the states of Maharashtra, Bihar, West Bengal, Chhattisgarh, Orissa, Gujarat, Madhya Pradesh, Rajasthan and in the Western Ghats. In Maharashtra, the major area under this crop is scattered in submountain area like Kolhapur, Ratnagiri and Pune district (Sawant *et al.*, 2002) [12].

Soil is declared as minor mineral by government of India so for purchasing soil there are many rules and regulations. Procedure to avail good quality garden soil as media is not easy but cumbersome. Annually for preparing one lakh grafts nursery man need 200 tons of soil. To run the viable business, nursery man needs to be supported by doing research on use of other media in nursery which will spare large quantity of soil. Different growing media other than soil like vermicompost, FYM and rice husk are light in weight and are having good porous structure so easily transported from one place to other (Khapare 2019) [6].

Presently the grafts of these crops are prepared in 5”×7” polybag. The demand for healthy and vigorous planting material of these crops in large sized polybag is increasing from farmers. The healthy and grown up grafts prepared in bigger size polybag exhibit enhanced growth, better adaptability after transplanting as well as fetch attractive price in the market. Soil as potting mixture has limitations regarding availability, weight of grafts as well as its growth in the media. Hence, it is of prime importance to standardize the suitable media composition for commercial propagation of grafts in the nursery. Hence, the present investigation was done to find out the effect of potting media and standardize bag size for survival and growth of karonda grafts.

### 2. Materials and Methods

The field experiment was laid out in Randomized Block Design. The experiments comprised of eleven treatments i.e., T<sub>1</sub>- Bag size 6”×8” with media Soil + FYM (3:1)- (Absolute Control), T<sub>2</sub>- Bag size 8”×10” with media Soil + FYM (3:1), T<sub>3</sub>- Bag size 8”×10” with media Soil + Vermicompost (2:1), T<sub>4</sub>- Bag size 8”×10” with media Soil + Vermicompost (1:1), T<sub>5</sub>- Bag size 8”×10” with media Soil + Vermicompost+ Rice husk (1:1:1), T<sub>6</sub>- Bag size 8”×10”

with media Soil + FYM+ Rice husk (1:1:1), T<sub>7</sub>: Bag size 10"×14" with media Soil + FYM (3:1), T<sub>8</sub>: Bag size 10"×14" with media Soil + Vermicompost (2:1), T<sub>9</sub>: Bag size 10"×14" with media Soil + Vermicompost (1:1), T<sub>10</sub>: Bag size 10"×14" with media Soil + Vermicompost + Rice husk (1:1:1) and T<sub>11</sub>: Bag size 10"×14" with media Soil + FYM + Rice husk (1:1:1) which were replicated thrice.

The experiment was conducted during 2020-21 to 2021-22. The data were analyzed statistically as per the method suggested by Panse and Sukhatme (1985) [9] using RBD and valid conclusions were drawn only on significant differences between treatment mean at 0.05% level of significance.

### 3. Results and Discussion

The data presented in table 1 and 2 revealed that, the effect of potting media and bag size treatments with respect to survival percentage and growth and root parameters which are taken at end of the experiment for two years. Observations taken at two months interval in karonda.

It was observed in karonda, from the pooled data of two seasons that the maximum height of graft (49.04 cm), maximum girth (6.36 mm), maximum number of leaves (49.88), number of shoots (7.03), number of nodes (6.25) was recorded in T<sub>11</sub> i.e., Bag size 10"×14" with media Soil + FYM + Rice husk (1:1:1). Bhagat *et al.*, (2013) [13] reported that Soil +FYM + Cocopeat (1:1:1) was the best media for rough lemon, Panchal *et al.*, (2014) [8] for *khirni*, Qayom (2011) [10] for mango. Among the various treatments, media which contains FYM and Rice husk produced healthy grafts. Superiority of these media might be attributed to high water and nutrient holding capacity, good drainage and porosity which helps maximum carbohydrate accumulation and large size polybags provided greater volume of plant media with more nutrients resulted in vigorous growth of the karonda grafts. Similar results were stated by Haldankar *et al.*, (2014) [5] when mango grafts grown in larger size polybag 10" X 14",

Kinuya, (2017) [7] for jojoba seedling in largest pot size (15 X 27.5).

Whereas, lowest height (28.19 cm), minimum girth (5.15 mm), minimum number of leaves (21.73), lowest number of shoots (4.93), lowest number of nodes (4.32) were noted in T<sub>1</sub>. The fastest absolute growth rate (0.0650 cm/day), relative growth rate (0.0099 cm/cm/day) was found in T<sub>5</sub>. The lowest absolute growth rate (0.0376 cm/day) and relative growth rate (0.0056 cm/cm/day) was recorded in T<sub>1</sub>. Similar findings were reported by Ramteke *et al.*, (2016) [11] in papaya in media soil + sand + cocopeat + vermicompost (1:1:1:1). From above result it was observed that grafts grown in polybag size (10" X 14") found to be superior for increased absolute and relative growth rate of karonda grafts. Similar findings were noted by Haldankar *et al.*, (2014) [5] for mango grafts in larger size polybag (10" X 14").

The maximum fresh weight of grafts (76.67 g), longest length of root (38.73 cm), highest number of adventitious roots (27.67), dry weight of root (10.78 g). Whereas, the minimum fresh weight of grafts (26.50 g), shortest length of root (18.90 cm), lowest number of adventitious roots (8.67), and minimum dry root weight (4.06 g) was observed in treatment T<sub>1</sub>. Similar results were reported by Abirami *et al.*, (2010) [1] in nutmeg. Gholap and Polara (2015) [4] in mango, Kinuya (2017) [7] for jojoba seedling, Aburge and Oti-Boateng (2011) [2] for *Jatropha curcas*. It is revealed that the different potting media and bag size did not significantly influence the sprouting and survival percentage. The survival was in the range of 98.00 to 100 per cent. Apart from the bag size, availability of nutrient and moisture in this media stimulated photosynthesis at higher rate in leaves of grafts. Considering the root data, discuss the survival percentage. Better root development might have complementary effect on higher survival. Similar results were reported by Adu-Yeboah *et al.*, (2015) [3] seedling survival was not significantly affected by the size of the polybag in cashew.

**Table 1:** Effect of different potting media and bag size on growth parameters of karonda grafts cv. Konkan Bold at 240 DAR

Treatment	Plant height (cm)	Girth above union (mm)	Number of leaves	Number of shoots	Number of nodes	AGR (cm/day)	RGR (cm/cm/day)
T <sub>1</sub>	28.19	5.15	21.73	4.93	4.32	0.0376	0.0056
T <sub>2</sub>	37.34	5.56	32.12	5.95	5.12	0.0536	0.0085
T <sub>3</sub>	38.09	5.55	32.80	5.52	5.08	0.0595	0.0092
T <sub>4</sub>	38.64	5.38	31.93	6.25	5.28	0.0616	0.0094
T <sub>5</sub>	39.29	5.29	34.14	6.28	5.38	0.0650	0.0099
T <sub>6</sub>	46.12	6.06	41.27	6.82	5.92	0.0639	0.0097
T <sub>7</sub>	41.63	5.95	37.20	6.45	5.72	0.0551	0.0085
T <sub>8</sub>	39.70	5.69	36.94	6.18	5.63	0.0402	0.0063
T <sub>9</sub>	40.59	5.74	35.92	6.55	5.83	0.0556	0.0087
T <sub>10</sub>	40.13	5.74	36.38	6.72	6.02	0.0493	0.0078
T <sub>11</sub>	49.04	6.36	49.88	7.03	6.25	0.0537	0.0085
Range	28.19-49.04	5.15-6.36	21.73-49.88	4.93-7.03	4.32-6.25	0.0376-0.0650	0.0056-0.0099
S.E.±	0.63	0.08	1.19	0.16	0.13	-	-
CD at 5%	1.87	0.24	3.52	0.48	0.38	-	-

**Table 2:** Effect of different potting media and bag size on root growth of karonda grafts cv. Konkan Bold at 240 DAR

Treatment	Fresh weight of graft (g)	Root length (cm)	No. of adv roots	Dry weight of root (g)	Survival (%)
T <sub>1</sub>	26.50	18.90	8.67	4.06	98.00
T <sub>2</sub>	51.67	22.28	12.50	5.17	99.83
T <sub>3</sub>	39.83	29.45	17.50	4.95	99.50
T <sub>4</sub>	43.83	25.88	10.67	5.10	99.83
T <sub>5</sub>	53.83	21.65	15.00	5.13	99.83
T <sub>6</sub>	58.42	31.68	17.83	7.55	99.67
T <sub>7</sub>	58.00	32.00	16.33	7.80	99.83
T <sub>8</sub>	49.00	31.13	13.17	5.60	99.67
T <sub>9</sub>	71.00	30.70	18.50	5.49	99.17
T <sub>10</sub>	51.25	30.53	15.00	6.37	99.50
T <sub>11</sub>	76.67	38.73	27.67	10.78	100.00
Range	26.08-76.33	18.90-38.73	8.67-27.67	4.06-10.78	98.00-100.00
S.E.±	1.87	0.95	1.10	0.17	0.29
CD at 5%	5.52	2.80	3.25	0.50	NS

#### 4. Conclusion

For karonda grafts height of grafts, girth above union, number of leaves, total number of shoots, number of nodes, absolute growth rate, relative growth rate, fresh weight of graft, length of roots, number of adventitious roots and dry weight of roots were best when rebagged in media containing soil along with FYM and rice husk. Bigger size polybags i.e., 10"×14" produced healthier grafts as compared to small size polybags. It is proved that the size of polybag 10"×14" with medium containing Soil, FYM and Rice husk in 1:1:1 proportion is best for survival and growth of karonda grafts under Konkan agro-climatic conditions.

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