



# EFFECT OF DIFFERENT CONCENTRATION OF IBA ON SHOOTING AND ROOTING OF STEM CUTTING OF KARONDA (*Carisa carandas* L.) CV. PANT MANOHAR UNDER MIST CONDITION

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## Abstract

The present investigation entitled “Effect of Different Concentration of IBA on Shooting and Rooting of Stem Cutting of Karonda (*Carisa carandas* L.) Cv. Pant Manohar Under Mist Condition” was carried out at the Horticultural Research Centre, Department of Horticulture, Chauras Campus, H.N.B. Garhwal University, Srinagar (Garhwal), Uttarakhand, India during the month from March 2016 to June 2016. The experiment was laid out in a Randomized Block Design with ten treatments and three replications. For uniform planting of cutting in each treatment, 10 cuttings were planted in each replication with accommodating 30 cuttings of a single treatment. Thus, there were 900 cuttings in the experimental field. The stem cuttings of Karonda (*Carisa carandas* L.) Cv. Pant Manohar were treated with IBA solution of different concentration *i.e.*, 4000 ppm, 5000 ppm, 6000 ppm, 7000 ppm, 8000 ppm, 9000 ppm, 10000 ppm, 11000 ppm, 12000 ppm and control by quick dip method. Among all the treatments, maximum percentage of sprouted cuttings (4.67%), minimum percentage of unsprouted cuttings (5.33%), maximum length of sprout per cutting (8.67cm), maximum average diameter of sprouts per cutting (3.0cm), maximum average number of sprout (2.33), maximum average number of leaves (9.33), maximum percentage of rooted cutting (40.67), average number of primary roots (11.67), average number of secondary roots (33.33), average length of root per cutting (8.97cm), diameter of root per cutting (2.33cm), fresh weight of roots per cutting (1.13g), dry weight of roots (0.71g) was noticed in 8000 ppm concentration IBA.

**Key words :** Karonda, hardwood stem cuttings, IBA, mist chamber.

## Introduction

There is wide variation in the types of fruits that are grown in different seasons and parts of the country. The various fruit crops which are indigenous to our county, such as banana, mango, jack fruit, karonda, falsa, bael, aonla etc (Goswami, 2000). Karonda (*Carissa carandas* Linn syn *Carissa congesta* Wight) belonging to the family Apocynaceae (commonly known as “Karaunda” in India, ‘Bengal currant’ or “Christ’s thorn” in South India) is indigenous to India and is found wild in Bihar, West Bengal and south India and in commercial plantations in the Varanasi district of Uttar Pradesh (Banik *et al.*, 2012). The *Carissa carandas* is an important minor fruit crop of tropical and subtropical areas and an important crop of arid zones. The fruits are used in processing factories for making commercial jelly by the name ‘Nakal cherry’ which closely resembles the canned cherry fruits (Mandal *et al.*, 1992). The unripe fruit is

thermogenic, aphrodisiac, appetiser and antipyretic and is useful in vitiated conditions of Pitta and Kapha, hyperpiesia, diarrhoea, anorexia and intermittent fevers. The ripe fruit is appetiser and antiscorbutic and is useful in burning sensation, skin diseases, scabies and pruritus. The roots are anthelmintic, stomachic and antiscorbutic and are useful in stomach disorders, intestinal worms, scabies and pruritus (Imran *et al.*, 2012). It is rich source of iron (39.10mg/100 g) and carbohydrates (67.10 mg/100 g edible portion). Seed propagation is easy and appears hardier drought resistant due to deep tap root system. But seed propagation brings genetic variability and leads to the low yield and poor quality of fruits. The vegetative method of propagation is advocated for eliminating for high degree of variability notice in seedling plantation. Propagation through cuttings is the best and less expensive method of its propagation (Upadhyay and Badyal, 2007). In plant propagation, the different environment *viz.*, glass house, net house, poly-house and

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mist chamber have been widely used for rooting of different types of cutting. Development of mist chamber is a major breakthrough in propagation of plants. (Prolings and Therios, 1976) reported that creating humid atmosphere by means of artificial mist around the planted cuttings either in concealed pot culture house or in open conditions has proved to enhance the process of rooting. Intermittent mist is often used on cuttings because it reduces the temperature of the leaves, lowers respiration, and increases relative humidity around the leaf surface (Langhans, 1955). IBA is the most promising growth regulator inducing rooting quickly. Exogenous application of IBA accelerates the rate of rooting, increase final rooting percentage and number of roots. However, relatively high concentrations of IBA have been reported

to be inhibitory to rooting (Leakey, 1990).

### Material and Methods

The experiment was carried out at Horticultural Research Centre, Chauras Campus, Department of Horticulture, H.N.B Garhwal University, Srinagar Garhwal), Uttarakhand, India during the month from March 2016 to April 2016. Srinagar (Garhwal) is located in the heart of Alaknanda valley (78° 47' 30" E longitude and 30° 13' 0" N latitude and at an elevation of 540 m above MSL), a semi-arid, subtropical climate with dry summer and rigorous winters with occasional dense fog in the morning hours from mid December to mid February. The experiment was laid out in a Randomized Block Design with ten treatments and three replications *viz.*, 4000 ppm, 5000 ppm, 6000 ppm, 7000 ppm, 8000 ppm, 9000 ppm, 10000 ppm, 11000 ppm, 12000 ppm and control by quick dip method. For uniform planting of cutting in each treatment 10 cutting was planted in each replication with accommodating 30 cuttings of a single treatment. Thus there were 900 cuttings in the experimental field. The percentage of sprouted cuttings, percentage of unsprouted cuttings, percentage of dead cuttings, number of sprouts per

cutting, average length of sprout (cm), average diameter of sprout (cm), number of leaves on new shoots, percentage of rooted cuttings, number of primary roots per cutting, length of longest root per cutting (cm), diameter of thickest root per cutting (cm), fresh weight of root per cutting (gm) and dry weight of root per cutting (gm) were recorded. Data recorded during the course of investigations were subjected to statistical analysis under randomized block design (Snedecor and Cochran, 1968). Valid conciliations were drawn after the determination of significance of difference between the treatments, at 5% level of probability. Critical difference was calculated in order to compare the treatment means.

### Result and Discussion

**Table 1 :** Effect of Different Concentration of IBA on Shooting Parameters of Stem Cutting of Karonda

Treatments	No. of sprouted cutting	No. of unsprouted cutting	No. of sprout /cutting	No. of leaves /cutting	Length of sprout	Diameter of sprout	% of rooted cutting
4000ppm	2.33	7.67	1.33	2.00	4.00	1.00	20.00
5000ppm	3.00	6.00	1.00	3.33	4.67	1.33	26.67
6000ppm	2.67	7.33	2.33	5.67	5.67	1.67	23.33
7000ppm	3.00	7.00	1.67	4.00	6.00	1.00	23.33
8000ppm	4.67	5.33	2.33	9.33	8.67	3.00	40.67
9000ppm	2.00	8.00	1.33	4.67	5.33	2.33	19.00
10000ppm	2.33	7.67	1.67	5.00	5.67	2.00	20.00
11000ppm	3.00	7.00	2.33	6.67	6.33	1.67	24.33
12000ppm	1.67	8.33	2.00	5.67	7.33	1.33	20.00
Control	1.00	9.00	1.00	3.00	5.00	1.67	9.67
<b>MEAN</b>	1.71	4.89	1.13	3.29	3.91	1.13	15.09
<b>S.Em±</b>	1.91	5.23	1.26	3.72	4.25	1.3	16.74
<b>CD (0.05)</b>	5.65	15.42	3.71	10.98	12.56	3.74	49.37

**Table 2:** Effect of Different Concentration of IBA on Rooting Parameters of Stem Cutting of Karonda

Treatments	Primary root per cutting	Secondary root	Length of root	Diameter of root	Fresh weight of root	Dry weight	Survival percentage
4000ppm	4.00	14.33	5.00	1.00	0.70	0.32	23.33
5000ppm	6.33	18.33	5.33	1.00	0.65	0.34	30.00
6000ppm	5.67	13.67	6.27	1.67	0.53	0.33	26.67
7000ppm	7.67	27.00	7.10	1.67	0.63	0.25	30.00
8000ppm	11.67	33.33	8.97	2.33	1.13	0.71	46.67
9000ppm	9.33	29.33	6.87	1.67	0.68	0.30	20.00
10000ppm	6.33	20.33	6.33	1.00	0.90	0.35	23.33
11000ppm	5.00	16.00	5.17	1.33	0.70	0.36	30.00
12000ppm	4.00	14.33	4.23	1.00	0.64	0.33	16.67
Control	2.00	6.33	2.33	1.00	0.32	0.16	10.00
<b>MEAN</b>	4.13	12.87	3.84	0.91	0.46	0.23	17.11
<b>S.Em±</b>	4.69	14.47	4.21	1.02	0.50	0.26	19.14
<b>CD (0.05)</b>	13.82	42.69	12.43	2.10	1.48	0.76	56.47

## Conclusion

Among various concentration of IBA, 8000 ppm concentration of IBA shows the best performance in terms of number of sprouted cutting, number of secondary root per cutting number of sprout per cutting, minimum number of dead cutting and percentage of rooted cuttings, average length of root per cutting, average dry weight of root.

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