

Stionic effect on rooting attributes in rose

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ABSTRACT

A field experiment was conducted at Horticultural Experiment and Training Centre, Basti (U.P.) 272001, India for two years continuously (2007-08 and 2008-09) to find out the stionic effect on rooting attributes in rose (*Rosa* species). Four rootstocks (*Rosa multiflora*, *Rosa indica* var. *Odorata*, *Rosa wichuriana* and *Rosa bourboniana*) and four scion cultivars (Montezuma, Nazneen, June Bride and Raktgandha) were taken for the experiment. Minimum days to root initiation (24.13 and 24.34), maximum percentage of rooted cutting (85.23 and 85.59), maximum number of roots per cutting (28.43 and 29.96), largest length of root (6.99 and 6.92 cm), thickest diameter of root (0.18 and 0.17 cm), maximum fresh weight of root (2.27 and 2.37 g) and maximum dry weight of root (1.35 and 1.35 g) were significantly improved by using the rootstock *Rosa indica* var. *Odorata* followed by the rootstock *Rosa bourboniana* during both the year of experimentation (2007-08 and 2009-08), respectively.

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INTRODUCTION

Rose is the queen of flowers. No other flower is a better symbol of love, adoration, innocence and other virtue that the rose. Rose is the national flower of England. It occupied the prime position in India and widely grown all over the country. Without rose, gardens are not considered complete. Growing of rose involves skill and specialized technique. Besides cultural practices, multiplication plays an important role in successful cultivation.

The rose rootstocks are easily budded by 'T' method and there is high percentage of success. The best budding time in India is from November to February (more precisely December to January) and after union of buds, budding start growing. In the rose nursery the common practice is to plant the cutting in one season and that they are taken care of one year till they are budded in the budding season. Thus, for raising a budding suited for planting, it requires normally two years. In this process more labour, money and care are required. The new method of cuttage- buddage is followed to reduce this long period in which cuttings are budded immediately and planted in the prepared rooting media in the month of December to January. It takes about 3 to 4 weeks for cutting to strike root and bud to grow.

Roses are woody perennials with partial bud dormancy operating at the basal portion of the canes and are perpetuating flowering, non-inductive plants. The

sprouting of auxillary buds is recurrent, when apical dominance is removed and environmental conditions are suitable for the growth. Due to terminal position of flowering, there is no antagonism between vegetative growth and flowering. Most of the vegetative and flowering parameters of roses are governed by rootstock as well as scion. Success of rose nursery depends upon the selection of suitable rootstocks.

Impact of stock on scion and scion on stock is known as stionic effect. It is well established fact that the rootstock exerts profound influence on the vigour, precosity, productivity and yield, quality of flowers, disease resistance, adoptability to soil and climatic conditions, nutrition, winter hardiness and finally longevity of scion varieties budded on them. Therefore, it is necessary to choose the right type of rootstock for budding or grafting roses. The vegetative growth characters like, length and diameter of sprout, number of leaflets and growth pattern of root like, number, length and diameter of root are influenced by the rootstocks of rose. A suitable combination between rootstock and scion is provided resistance against many diseases like, wilt; provide better survival in field and adverse climatic conditions and export quality budding and flowers.

MATERIALS AND METHODS

An experiment was carried out to study the suitable bud-graft-cuttage in rose in relation to different stionic

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combination at Horticultural Experiment and Training Centre, Basti (U.P.) for two years continuously (2007-08 and 2008-09). The experiment was conducted in Factorial Randomized Block Design (FRBD) with sixteen treatments in each and replicated thrice. Field was divided into three blocks, each representing replication. Four rootstocks (*Rosa multiflora*, *Rosa indica* var *Odorata*, *Rosa witchuriana* and *Rosa bourboniana*) and four scion cultivars (Montezuma, Nazneen, June Bride and Raktgandha) were taken for the experiment.

The soil of experimental plot was sandy loam with pH 7.8, 0.33 m.mhos cm⁻¹ ECe, low in organic carbon (0.48%), low in available nitrogen (203.07 kg/ha) and medium in available phosphorus (19.60 kg/ha) and potash (301.45 kg/ha). Total rainfall recorded during experimentation in 2007-08 and 2008-09 was 900.3 mm and 1719.3 mm, respectively.

About 20 cm long semi hard woods cutting of lead pencil thickness were prepared with the help of a secateur. The selected buds were inserted on the cutting and then tied with suitable wrapping material *i.e.*, polythene tape. The process of preparation of bud-graft-cuttage is called stenting. Before planting in bed, these cuttings were treated with 2000 ppm IBA solution for inducing more rooting.

RESULTS AND DISCUSSION

A critical examination of Table 1 revealed that all the rooting character taken for experimentation did not influenced by scion cultivars and interaction between scions and rootstocks. However, it was altered significantly due to rootstocks. The best rooting performance of rose was obtained with the rootstock *Rosa indica* var. *Odorata* among all the four rootstocks; Montezuma among all the four scion cultivars; and Montezuma budded on *Rosa indica* var *Odorata* among all the sixteen treatment combinations used in the experiment. The performance of different characters *viz.*, minimum days to root initiation, maximum percentage of rooted cutting, maximum percentage of roots per cutting, largest length of root, thickest diameter of root and maximum fresh and dry weight of root were significantly improved by using the rootstock *Rosa indica* var. *Odorata* followed by the rootstock *Rosa bourboniana*. Rootstock *Rosa indica* var. *Odorata* required minimum days to root initiation (24.13 and 24.34 day) followed by *Rosa bourboniana* and *Rosa multiflora* while *Rosa witchuriana* required maximum days to root initiation (25.63 and 25.64 day), during both the years, respectively. This finding is in agreement with the finding of Kumar *et al.* (1998). *Rosa indica* var. *Odorata* showed the highest

Character	Days to root initiation		Percentage of rooted cuttings		Number of roots per cutting		Maximum length of root (cm)		Maximum diameter of root (mm)		Maximum fresh weight of root (g)		Maximum dry weight of root (g)	
	2007/08	2008/09	2007/08	2008/09	2007/08	2008/09	2007/08	2008/09	2007/08	2008/09	2007/08	2008/09	2007/08	2008/09
<i>Rosa multiflora</i>	24.65	24.81	82.97	82.69	27.85	27.85	6.33	6.19	0.16	0.16	2.15	2.27	1.32	1.29
<i>Rosa indica</i> var. <i>Odorata</i>	24.13	24.34	85.23	85.59	28.73	29.96	6.99	6.92	0.18	0.17	2.21	2.31	1.35	1.35
<i>Rosa witchuriana</i>	25.63	25.64	71.59	78.32	26.07	27.10	5.53	5.36	0.17	0.17	1.95	2.08	1.22	1.22
<i>Rosa bourboniana</i>	24.36	24.51	87.81	87.06	28.17	28.17	6.67	6.69	0.16	0.17	2.19	2.28	1.37	1.37
S.E.	0.37	0.21	1.17	1.52	0.50	0.60	0.30	0.30	0.07	0.07	0.07	0.06	0.03	0.03
C.D. (P 0.05)	0.81	0.71	7.97	7.30	1.72	1.69	0.86	0.85	0.02	0.02	0.20	0.16	0.07	0.07
Cultivars (Scion)														
Montezuma	24.11	24.15	85.80	85.72	28.23	30.17	6.82	6.77	0.17	0.18	2.25	2.37	1.37	1.37
Nazneen	25.08	25.29	80.19	80.12	26.90	28.06	5.95	6.07	0.15	0.15	2.03	2.17	1.25	1.25
June Bride	24.55	24.65	83.68	83.28	27.96	29.35	6.02	6.57	0.16	0.17	2.27	2.26	1.37	1.37
Raktgandha	24.96	24.91	80.93	81.55	27.35	28.79	6.08	6.17	0.16	0.16	2.08	2.20	1.37	1.27
S.E.	0.37	0.21	1.17	1.52	0.50	0.60	0.30	0.30	0.07	0.07	0.07	0.06	0.03	0.03
C.D. (P 0.05)	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
NS Not significant														

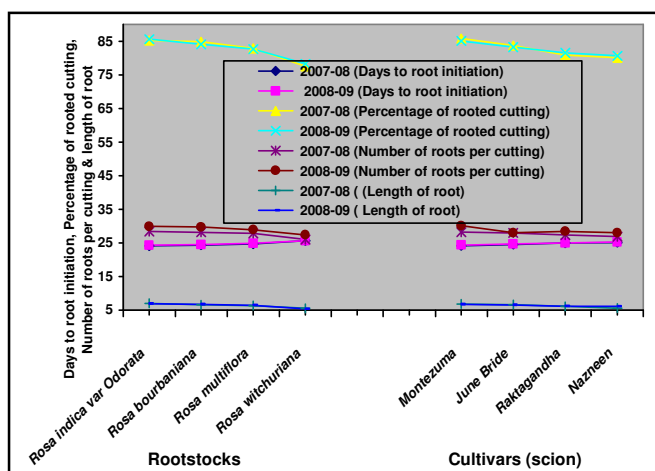


Fig. 1 : Effect of different rootstocks and cultivars (scion) of rose on days to root initiation, percentage of rooted cutting, number of roots per cutting and length of root

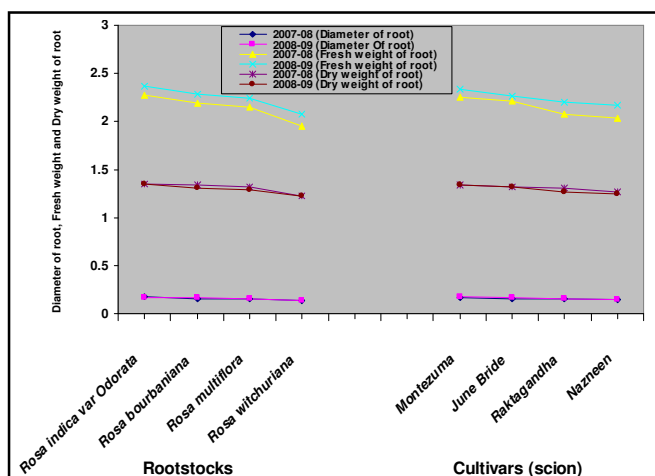


Fig. 2 : Effect of different rootstocks and cultivars (scion) of rose on diameter of root, fresh weight and dry weight of root

percentage of rooted cutting (85.23 and 85.59%) followed by *Rosa bourboniana* and *Rosa multiflora* and the lowest percentage of rooted cutting was found in *Rosa witchuriana* (77.59 and 78.32%). Das *et al.* (1978) observed similar results and reported that in *Rosa indica* var. Odarata the best rooting was obtained followed by *Rosa multiflora*. Swarup and Malik (1974) found similar result and reported that the rootstock *Rosa indica* var. Odarata exhibit the maximum percentage of success in rooting (89.78%) followed by *Rosa multiflora* (87.03%). Aslam and Khan (1973) also reported that rootstocks influenced the percentage of rooted cuttings. Among the four rootstocks, *Rosa indica* var. Odorata gave highest number of roots per cutting (28.43 and 29.96) followed by *Rosa bourboniana* and *Rosa multiflora* whereas,

minimum number of roots per cutting was found in *Rosa witchuriana* (26.04 and 27.40). These findings are in agreement with those reported by Das *et al.* (1978) in rose and Pasrija and Chitkara (1991) in Peach. *Rosa indica* var. Odorata showed the longest (6.99 and 6.92 cm) and thickest (0.18 and 0.17 cm) root followed by *Rosa bourboniana* and *Rosa multiflora*; where as the shortest (5.53 and 5.36 cm) and thinnest (0.14 and 0.14 cm) root was found in *Rosa witchuriana*. The rootstocks exhibited significant effect on the length and diameter of root (Fig. 1). Work of Lee and Zieslin (1978) and Singh and Lal (1985) in rose support these findings. Increased fresh weight and dry weight of root is the result of combined effect with roots per cutting, length and diameter of roots. *Rosa indica* var. Odorata showed the maximum fresh weight (2.27 and 2.37g) and dry weight (1.35 and 1.35g) of root followed by *Rosa bourboniana* and *Rosa multiflora* whereas, *Rosa witchuriana* exhibited minimum fresh weight (1.95 and 2.08g) and dry weight (1.22 and 1.22g) of root during both the years of experimentation (Fig. 2). Singh and Lal (1985) and Eris and Celic (1981) reported similar changes in dry matter content of root of *Rosa bourboniana* and *Vitis venifera*, respectively.

REFERENCES

- Aslam, M. and Khan, D.A. (1973). Nursery performance of rose rootstocks. *Pakistan J. Agric. Sci.*, **8**(3/4): 103-109.
- Das, P., Mahapatra, P. and Das, R.C. (1978). Effect of growth regulators on rooting in stem cuttings of some rose rootstocks. *Orissa J. Hort.*, **6**(1/2): 31-33.
- Eris, A. and Celic, H. (1981). Effects of some plant growth regulators on bud burst and rooting of *Vitis vinifera* cultivar Chaush cuttings. *Am. Enolitic*, **32**(2):122-124.
- Kumar, S., Chaturvedi, O.P., Singh, A.R. and Kumar, S. (1998). Response of different stionic combinations on bud-graft-cuttage in rose. *J. Ornamental Hort.*, **4**(1-2): 13-17.
- Lee, C.I. and Zieslin, N. (1978). Root regeneration of Manetti rootstock grafted with different scion cultivars of rose. *Hort. Sci.*, **13**(6): 665-666.
- Pasrija, A.K. and Chitkara, S.D. (1991). Comparative growth of various stocks and stionic combinations of peach in pots. *Res. & Develop. Reporter*, **8**(1): 70-72.
- Singh, A.R. and Lal, B. (1985). Propagation of rose by bud-graft-cuttage with the aid of IAA. *Prog. Hort.*, **17**(2): 142-144.
- Swarup, V. and Malik, R.S. (1974). Studies on the performance of rose varieties on different rootstocks. *Indian J. Hort.*, **31**: 268-273.

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