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Short Communication

Effect of Growth Regulators on Stem Cutting of *Rosa bourboniana* and *Rosa gruss-an-teplitz*

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ABSTRACT

This study was initiated to observe the effect of Indole butyric acid (IBA) and combination of Indole acetic acid and Indole butyric acid (IAA+IBA) on vegetative growth as well as on rooting behavior of two *Rosa* species. Rooting was improved by the application of the growth regulators. Other vegetative growth parameters were also better. Minimum number of days for emergence of first bud, maximum number of sprouted buds, length of sprouted buds and tallest were obtained by the application of growth regulators. Better response in relation to plant height (94.3 cm) was observed in *Rosa bourboniana* where as maximum plant height depicted by *Rosa gruss-an-teplitz* was 42 cm. Maximum survival percentage was found in those cuttings which were treated with IBA (1000 ppm) and IBA+IAA (250+250 ppm).

Key Words: *Rosa bourboniana*; *Rosa gruss-an-teplitz*; Rooting; IBA; IAA

INTRODUCTION

Rose is a symbol of perfection, elegance, romance and love. It was called "The Queen of Flowers" firstly by Greek poetess in her "Ode to the Rose" (Muhammad *et al*., 1996). There are two main prospects of production of roses, i.e., food products and cut flowers (Hessayon, 1988). The most important products are rose water, rose oil and cut flower. They have very high economic value in international market. Rose products also very commonly used in cosmetic, perfume, and pharmaceutical industry. In this process of varietals evolution, however, the focus was sharpened towards the form and colour of the bud with consequence of fragrance loosing the emphasis (Muhammad *et al*., 1996). The world's main rose exporters are Holland (65%), Colombia (13%), Israel (8%), Italy (7%) etc. and importers are Germany, USA, and France, UK, and Gulf countries. Roses are conventionally propagated by cuttings, budding, grafting and layering methods. Except cuttings, all methods are quite extensive, laborious and time consuming. Cuttings are the simplest way to multiply the desirable rose varieties. But success rate through cuttings is limited in most of the rose varieties due to failure proper root formation. This problem can overcome by use of plant growth regulators. Pandey and Sinha (1977) reported that plant growth regulators could promote rooting in many ornamental plants including roses. Now a day, growth substances are being used in the commercial propagation of different crops. The compounds commonly used for root induction, include Indole butyric acid (IBA) and Seradix (Randhawa & Mukhopadhyay, 1994; Pandey & Sinha, 1997).

The objective of the research was to stimulate root initiation, an increase in the percentage of cuttings that form roots and acceleration of rooting time. The study was planned to investigate response of growth hormones on stem cuttings of two varieties of rose for root induction.

MATERIALS AND METHODS

The present project was conducted in Floriculture Research Area, Institute of Horticultural Sciences, University of Agriculture, Faisalabad. Six inches long hardwood stem cuttings of *Rosa bourbonian* and *Rosa gruss-an-teplitz* were taken from uniform, healthy and vigorous plants of same age having three to four dormant buds. Indole butyric acid (IBA) solution was prepared by dissolving 500 mg and 1000 mg per liter distilled water. Similarly, Indole acetic acid (IAA) + IBA solution was prepared by dissolving 250+2500 mg and 500+500 mg per liter distilled water. Growth regulators are water insoluble, so they were first dissolved in 1 N 5 mL NaOH solution. The cuttings were treated by quick dip method. The basal portion of cuttings (3 cm) was dipped in prepared solutions. Distilled water was used as control. The experiment was laid out according to randomized complete block design with factorial arrangement. There were 5 treatments, each treatment having 10 plants with 3 replications. Data was collected for emergence of first bud (days), number of sprouted buds, length of sprouted buds (cm), plant height (cm) number of roots, length of roots and rooting percentage. Treatment means were compared using Duncan's Multiple Range (DMR) test (Steel & Torrie, 1984).

Table I. Effect of growth regulators on various growth parameters of *Rosa* species

Treatment	Sprouting of First Bud (Days)	Number of Buds	Length of Buds (cm)	Number of Roots
Control	21.4 a	2.1 c	18.9 c	12.5 d
IBA 500 ppm	14.7 c	5.3 a	37.7 b	28.7 b
IBA 1000 ppm	15.4 b	4.2 b	46.6 a	41.2 a
IBA+ IAA 250+250 ppm	14.9 bc	5 ab	36.3 b	23.9 c
IBA+ IAA 500+500 ppm	15.6 b	4.5 b	32.9 b	30.5 b

Table II. Effect of *Rosa* species on various treatments

Variety	Treatment	Plant Height	Length of Roots	Survival Rate (%age)
	Control	35.6 c	12.8 e	46.6 e
	IBA 500 ppm	84.2 a	26.5 c	81.6 cd
Rosa Bourboniana	IBA 1000 ppm	94.3 a	34.7 a	93.3 ab
	IBA+ IAA 250+250 ppm	58.7 b	2.5 c	86.6 bc
	IBA+ IAA 500+500 ppm	61.1 b	31.3 b	80 cd
	Control	19.6 d	10.4 f	46.6 e
	IBA 500 ppm	38.7 c	21.5 d	76.6 d
Rosa gruss-an-teplitz	IBA 1000 ppm	42 c	29.4 b	96.6 a
	IBA+ IAA 250+250 ppm	36.4 c	27.2 c	90 ab
	IBA+ IAA 500+500 ppm	35.5 c	31 b	93.3 ab

REULTS AND DISCUSSION

Minimum number of days for sprouting of first bud (14.7) and maximum number of sprouted bud (5.3) was attained by the application of IBA at 500 ppm, although IBA (500 ppm) + IAA (500 ppm) stood at par statistically with IAA in the above mentioned parameters. While IBA at 1000 ppm resulted in longest bud (46.6 cm) and maximum number (41.2 cm) of roots (Table I). Variety and treatment interaction regarding sprouting of first bud, number of buds, length of buds and number of roots were non-significant. Similar findings wee noted by Al-Rawi (1976).

Significant interaction of variety and treatment was depicted against plant height, length of roots and survival rate. The tallest plants (94.3 cm), longer roots (34.7) and maximum rooting percentage (93.3) were achieved by IBA at 1000 ppm in *R. bourboniana* (Table II). Bhujbal and Kale (1973) confronted the similar situation in rose plants that maximum root length was produced at 1000 ppm of IBA. Pivetta *et al*. (1999) also concluded that maximum rooting percentage (95%) was obtained by three applications of IBA at 1000 ppm. Length of root could be attributed to two factors; first, genetic constitution and secondly amount of foliage on aerial sprays. Genetic factor is combination of set of genes favorable for the establishment of root system. Extent of foliage could be could be responsible for enhanced development of root. Leaves are the site of food manufacture which is translocated to the roots for development regardless of the genetic potential (Osterbye, 1970).

CONCLUSION

Both varieties behaved equally well regarding the sprouting of buds, length of buds and number of roots in response to growth regulators. *R. bourboniana* performed comparatively better than *R. gruss-an-teplitz* for rest of the parameters of study. IBA alone performed better than IBA+IAA.

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