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Clonal Propagation of Guava (*Psidium guajava* L.)

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ABSTRACT

The studies on the hardwood cuttings of Guava were conducted at Postgraduate Agriculture Research Station (PARS), University of Agriculture, Faisalabad. Six to eight inches hardwood cuttings of two selections of guava were taken from 3-4 years old trees. These cuttings were treated with IBA at 500 and 1000 ppm, respectively and tap water as a control. Root analysis were conducted for average number of roots per cutting, average rot length per cutting, number of sprouted cuttings, percentage of rooted cuttings and for mortality rate were determined.

Key Words: Clonal propagation; Guava

INTRODUCTION

Guava (*Psidium guajava* L.) is an evergreen plant belonging to family Myrataceae and has been cultivated since ancient times. It is believed to have been grown in sub-continent since early 17th century. It can be grown under wide range edaphic and climatic conditions. It is an important fruit having two crops in a year and is grown in all the provinces of country. Guava fruit is highly nutritious and rich in vitamin C. It enjoys 4th position with regards to production among the fruits being grown in Pakistan. The guava has been reported to be grown over an area of 60.8 thousand hectares with total production of 461.4 thousand tones. Guava propagation through seed does not produce true to type plants while clonal propagation have assured true to type plants. Maqbool and Khan (1973) reported that guava is commercially propagated from seeds in Pakistan. Standard variety of this fruit tree does not exist in the country. The use of growth regulators in enhancing rooting for cuttings is well documented for guava.

The use of stem hardwood cutting is the least expensive method for vegetative propagation (Hartman, 1969). However, guava hardwood cuttings were found hard to root (Luis *et al.,* 1986; Regule, 1964; Webber, 1942). Moreover, the use of growth regulators to increase rooting percentage of guava stem cuttings had limited success (Ahmad, 1963; Sinha *et al.,* 1964; Wally *et al.,* 1981).

MATERIALS AND METHODS

Research studies for the project was carried out at Postgraduate Agriculture Research Station (PARS), University of Agriculture, Faisalabad during August-October, 2000. The experiment was laid out in Randomized Complete Block Design, i.e. 10 cuttings per treatment with four replications were planted on bed prepared of soil under conserve moisture in air tight polyethylene tunnels.

Preparation of growth regulators. Two concentrations of indole butyric acid (root promoting hormone) were prepared in 50% ethanol to make 500 and 1000 ppm IBA.

Source of cuttings. There were two selection of variety Gola i.e. selection-1 and selection-2

Cuttings were collected from already grown trees at PARS and planted after treatment with IBA during the month of August-October, 2000 for studies.

Treatments. T_0 = Control; T_1 = 500 ppm IBA; T_2 = 1000 ppm IBA

Data collected. Number of sprouted cuttings, Average number of roots per cutting, Percentage of rooted cuttings, Average root length per cutting, Mortality rate

Statistical analysis. The experiment was laid out in accordance with RCBD with four replications and analysis of variance was done at 5% level of probability. Means were compared according to Duncan's New Multiple Range Test (Steel & Torrie, 1980).

RESULTS AND DISCUSSION

Present research project was initiated with a view to multiply the guava plant behaviour, hard wood cuttings were dipped in different concentrations of IBA. Various growth characteristics of treated as well as untreated cuttings were studied and the results obtained for various characteristics are summarized in Table I.

Data on percentage of rooted cuttings revealed superiority of 1000 ppm IBA dipping. Number of rooted cuttings treated with IBA at 1000 ppm were more than 500 ppm treated cutting i.e. 37% and control 17.5%. Data concerning number of roots/cutting revealed significant superiority of 1000 ppm IBA (T_2). However, it was observed that number of roots were more than double in T_2 than T_1, and the control treatment was in the bottom.

Data related to total length of roots also exhibited supermacy of IBA 1000 ppm (T_2) treatment. Maximum length of roots (261.5 cm) was measured in hard wood cuttings treated with IBA 1000 ppm while the minimum (2.313 cm) was noticed in control treatment. IBA at both concentrations significantly increased root length while control produced minimum roots. Cuttings treated with IBA at 500 ppm (T_1) showed more sprouted percentage (51.25%)

Table I. Success percentage of rooted cuttings in guava

Treatments	% age of rooted cuttings		Av. number of roots		Av. Sprout length/cutting		No. of sprouting cuttings		Mortality percentage	
	1st Sept.	15th Sept.	1st Sept.	15th Sept.	1st Sept.	15th Sept.	1st Sept.	15th Sept.	1st Sept.	15th Sept.
T_0 = Control	20.00	17.50	5.626	40.250	261.50	231.3	22.50	18.75	73.75	76.25
T_1 = 500 ppm IBA	45.00	37.50	42.13	35.38	47.88	42.25	51.25	47.50	46.55	52.50
T_2 = 1000 ppm IBA	50.00	40.00	168.90	147.40	2.313	2.162	47.50	40.00	47.50	51.25

Fig. 1. Soft wood cuttings (left), IBA 500 ppm quick dip method hard wood cuttings (right)

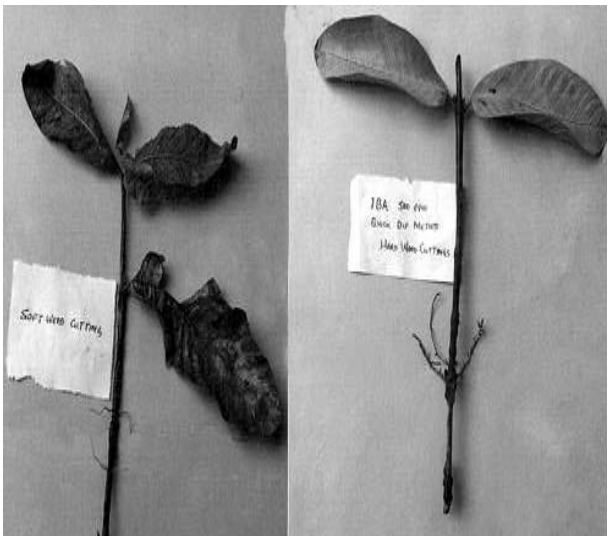
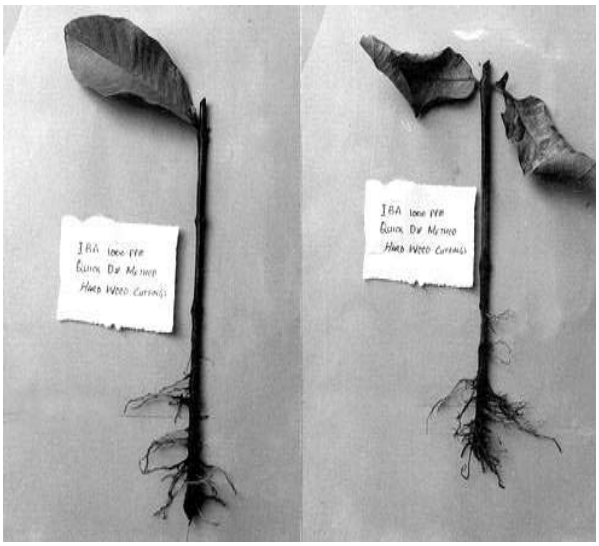


Fig. 2. IBA 1000 ppm quick dip method hard wood cuttings



although there was a slight difference in sprouting of cutting treated with 1000 ppm IBA (T_2), however, the control produced only 22.5% sprouting. Data related to mortality percentage also showed that maximum mortality occurred in control (T_0). However there was less mortality percentage in the cuttings treated with IBA at T_2 and T_1, respectively, i.e. 47.50 and 46.25%. An overall situation lead to the conclusion that IBA at higher concentration possesses more potential in the development of roots, sprouting and decreases the mortality percentage that the control and lower concentrations of IBA.

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