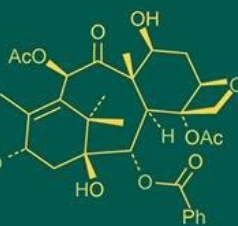
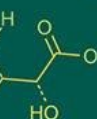


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Effect of pre curing and plant growth regulators on grafting and growth of guava (*Psidium guajava* L.)

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Abstract

The experiment was conducted to study the effect of pre curing of scion and plant growth regulators on grafting growth of guava (*Psidium guajava* L.) at the department of Horticulture, college of Agriculture, Ummedganj, Kota, KVK Model nursery Agriculture university during the year of 2020-21. In the investigation, 1-49 variety of guava was selected as mother plant for scion bud. The foliar spray of NAA and BA (50 and 20 ppm each) either on rootstock or scion branch was applied 10 days prior to grafting. the most responsive treatments are foliar spray on rootstocks with NAA@50ppm graft success (81.55%) and also maximum fresh weight (13.10 g/root) was recorded at 10 days before grafting defoliation with spray of 50 ppm NAA on scion and similarly maximum dry weight of roots 8.20g/root with spray of NAA @ 50 ppm on scion which are significantly higher than all other treatment.

Keywords: Guava, grafting, root weight

Introduction

Guava (*Psidium guajava*) popularly known as apple of tropic and is native to the tropical America stretching from Mexico to Peru. Although, it is native to tropical America, widely distributed throughout the tropical and subtropical region of the world. Guava belongs to family Myrtaceae and has recognition of being the most widely cultivated species of his family. Guava includes 150 species, but only a few species have horticultural value. The mostly common guava (*Psidium guajava* L.), other species is cattle guava (*Psidium cattleianum* Sabine), which is also grown commercially. At present, major guava producing countries, the Hawaiian Island, Cuba and India. Guava has been well adopted to India and considered the fruit of masses in terms of availability, nutritional value especially good source of vitamin C, pectin, calcium, phosphorous and price structure in comparison to other fruit crops. In India, guava is the fourth most important fruit crop in area and production after mango, banana and citrus. Guava ranked fifth in productivity among different fruit crop in India. The total area and production of guava in the country is 2.65lakh hectare and 4.054million tones, respectively, (Anonymous, 2018a) ^[1]. Major guava producing states are Bihar, Uttar Pradesh, Maharashtra, Karnataka, Orissa, West Bengal, Andhra Pradesh and Rajasthan. In Rajasthan net cultivated area of guava is 4622 hectares with production of 81553 MT. Major guava growing districts of Rajasthan Bundi, Chittorgarh, Sawai Madhopur, Udaipur, Dholpur, Kota. Out of which Sawai Madhopur leading district having an area of 2164 hectare with production of 39495 MT followed by Bundi i.e. 693-hectare area and 13426 MT production. ((Anonymous, 2018b) ^[1]. The productivity of guava is much below then the production potential. This might be due to various factors such as crop management, Climatic & soil condition, irrigation & nutrition management, availability of quality planting material and plant protection. The availability of quality planting material play key role in increasing quality production and productivity. It has been reported that only 10 per cent farmers adopted the vegetative propagated plant material in guava. Guava plant have been propagated through seeds since long time. The seed propagated plants results is variation in shape and size, quality of fruit and are not true- to- type, whereas, vegetatively propagated plants are true-to -type with short juvenile phase. The grafting of guava is one of the most common propagational method, which is now trending but success rate is very low, resulted in to higher plant raising cost. The proper curing of the. scion and use of plant growth regulators for better graft union and higher rate success in guava may resolve the

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aforesaid problem up to some extent. Similarly, pre curing of the scion through defoliation and age of the scion shoots plays important role in success of grafting. The pre curing of scion enhances physiological and bio logical changes in both terminal and auxiliary bud. It also promoted callusing and shoot growth. However very little or nosy schematic research has been conducted on this aspect in agro-climatic condition of *Hadoti* region of Kota division, Rajasthan. Keeping in this view an experiment entitled “Effect of Pre curing of Scion and Plant Growth Regulators on Grafting and Growth of Guava (*Psidium guajava* L.) sapling”.is proposed in this synopsis.

Materials and Methods

The present investigation entitled “Effect of defoliation of scion and plant growth regulators on wedge grafting and growth of sapling in guava (*Psidium guajava* L.) was carried out at the nursery unit of Krishi Vigyan Kendra, Borkhera, Kota under the supervision of Department of Horticulture, College of Agriculture, Umedganj, Kota (Agricultural University, Kota) during November 2020. The Guava seedling were raised at Model nursery, Krishi Vigyan Kendra, Borkhera, Kota for rootstock purposes. The seedling of 6 to 8 month old having diameter of 0.5 to 1 cm were selected for experimentation.

Plant growth regulators: The stock solution of NAA and BA of 5000 ppm were prepared. For which 5 gm of each NAA and BA were weight separately and dissolved in small quantity of appropriate solvents *i.e.* NAA was dissolved in the absolute ethylene alcohol, while the BA was dissolved in 1 N NaOH, then make up the volume of one litre water with distilled water.

Process of wedge grafting

After selection of rootstock and scion, the rootstock were planted in nursery bed according to the layout of experiment. Thirty rootstock were planted in each bed, 15 days prior to actual grafting process. Thereafter on the day of grafting the rootstock were headed back by retaining 15-20 cm long stem above the soil level. The beheaded rootstock were split to about 4.0 to 4.5 cm deep through the centre of the stem with sharp and clean sterilized grafting knife. A wedge shaped cut of 4 to 4.5 cm long was made on the lower end of selected scion shoot. The prepared scion stick was then inserted into the split of the rootstock and pressed properly so that cambium tissues of the rootstock and scion came in contact with each other. During inserting of scion on rootstock the care was exercised to match the cambium layer of the stock and scion as closed as possible. The union was then tied with the help of 200 gauge stretchable polythene strip of 1.5 cm wide and 40 cm long. Immediately after grafting, the grafts were covered by 25×10 cm white polythene bags. The scion sprouting was started after 10-12 days of grafting. The polythene cap was removed after 25 days in the evening hours.

Results and Discussion

1. Effect of defoliation of scion and plant growth regulators on graft success

The data on joint application of defoliation of scion and plant growth regulators treatments on survival of guava graft are given in (Table 1). It is evident from the data that joint application of defoliation and plant growth regulators

treatments had significantly increase the survival of guava graft (Appendix III). The maximum survival of guava graft (91.00%) recorded at Defoliation 10 days before grafting with spray of 50 ppm NAA on scion treatment which significantly superior over all other treatments except treatment of Defoliation 10 days before grafting with spray of 25 ppm BA on rootstock). However, the minimum guava graft survival of 42.33 per cent was recorded at control.

2. Effect of defoliation of scion and plant growth regulators on fresh weight of root

The data on fresh weight of roots in grafted guava saplings as affected by different joint application of defoliation of scion and plant growth regulators treatments are presented in (Table 1). The combined application of defoliation of scion and plant growth regulators treatment significantly increase the fresh weight of roots as compared to control. However, the maximum fresh weight of 13.10 g/root was recorded at defoliation of scion 10 days before grafting with spray of 50 ppm NAA on scion which was significantly higher than all other treatment. The minimum fresh weight of root in grafted guava sapling was recorded at control (4.35 g/ root).

3. Effect of defoliation of scion and plant growth regulators on dry weight of root

The data on dry weight of roots in grafted guava saplings as affected by different joint application of defoliation of scion and plant growth regulators treatments are presented in (Table 3). The combined application of defoliation of scion and plant growth regulators treatment significantly increase the dry weight of roots as compared to control. However, the maximum dry weight of 8.20 g/root was recorded at defoliation of scion 10 days before grafting with spray of 50 ppm NAA on scion which was significantly higher than all other treatment. The minimum dry weight of dry in grafted guava sapling was recorded at control (1.61 g/ root).

Table 1: Effect of pre curing and plant growth regulators on Graft success (%), Fresh weight of root (g/root), Dry weight of root (g/root)

Treatment	Graft success (%)	Fresh weight of root (g/root)	Dry weight of root (g/root)
Control	49.6	4.35	1.61
Defoliation 10 days before grafting + Spray of NAA 50 ppm on scion	88.66	13.10	8.20

Conclusion

The effect of pre curing and pgr on grafting and growth of guava. it is fourth most important fruit crop in terms of area and production after mango, banana and citrus. wedge grafting technique has potential of multiplying guava plants rapidly throughout the year even in exteme climate condition such as severe cold. The most effective treatment was a foliar spray of NAA at a conetration of 50ppm on scion.

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