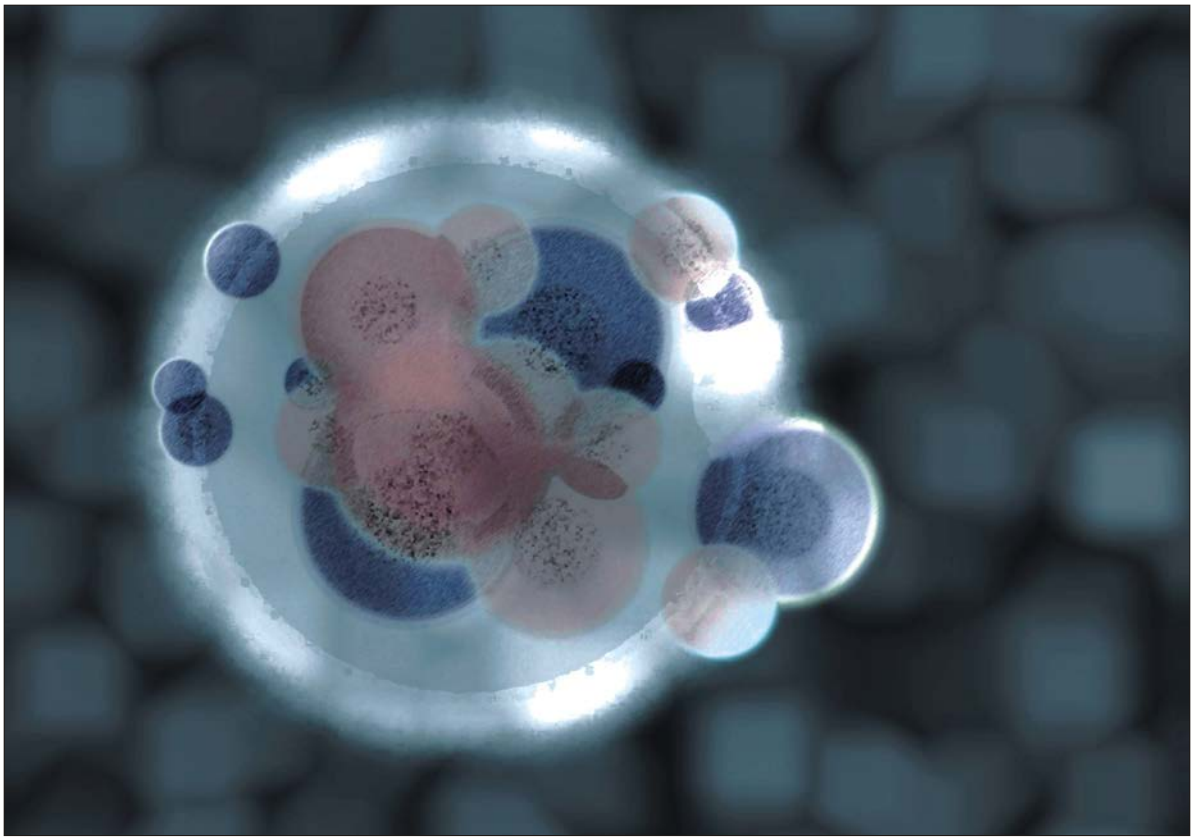

Journal of Biological Sciences

ISSN 1727-3048

science alert

ANSInet
an open access publisher
http://ansinet.com

OnLine Journal of Biological Sciences 1 (3): 111-112, 2001

Macro-propagation of Guava (*Psidium guajava* L.)

[1]Mir Saleem Khattak, M.N. Malik[2] and M.A. Khan[3]
[1]Agricultural Research Institute, Tarnab, Peshawar
[2,3]Department of Horticulture, University of Agriculture, Faisalabad, Pakistan

Abstract: Macropropagation of guava (Psidium guajava L.) cv. Sufeda by T-grafting and Chip budding was investigated 6 times beginning April 15 at monthly interval upto September, 15. Scionwood of cv. sufeda was prepared on the tree by excising 10 - 15 cm terminal growth 20 days prior operation. These were grafted/budded on to land race guava root-stock. Maximum sprouting of 93.33% was produced in T-grafting on July, 15 followed by chip budding (86.7%) on June, 15. After a year's shoot length (24.0 cm) was prominent in chip budding and shoter one (17.94 cm) in T-grafting. The highest success rate of (86.7%) was obtained in T-grafting on July, 15. Chip budding also gave better survival of budded plants (80.00%) on June, 15. The interaction between propagation methods x months of operation was found non-significant. T-grafting had given best survival of propagated guava plants on July, 15 and August, 15 and chip budding on June, 15. T-grafting has expressed superiority over chip budding in the present experiment but from economic point of view chip budding is superior because, it is easy, quick and use of one bud instead of whole shoot in the operation.

Key words: Psidium guajava L. budding/grafting, scion woods, different months, Pakistan

Introduction

Guava is difficult to root even if cuttings are taken from previous year's or new growth (Ahmad, 1966; Khattak *et al*., 1983). T-grafting, chip grafting, patch budding, air layering and in arching were tried by various workers. But in arching gave better results but this method is costly, time consuming and un-economical (Samson, 1986). T-grafting practiced by Ali (1972), he reported only sprouting percentage and no success percentage of sprouted plants. Various vegetative methods as early reported are practiced in the species in various countries but none of the method is using in the commercial nurseries of Pakistan. It is, mainly propagated by sexual method that creates a high degree of variation among trees of the varieties. Therefore, a research project was envisaged to find out the most economical and efficient method of vegetative propagation of guava plant to produce true to type clonal materials in the species.

Materials and Methods

Experiment was conducted at the experimental area of Horticulture Department, University of Agriculture, Faisalabad. The seed of guava land race were prepared as root-stock (Bose *et al*., 1991). A year's old seedlings were used for propagation purposes. The technique of T-grafting/chip budding were followed after Ali (1972) and Jaffee (1970) respectively. Scion shoots were prepared on bearing trees by clipping 10-15 cm terminal growth 20 days prior operation. Grafting/budding were carried out monthly started from April 15, until September, 15. The experiments was repeated in the following year. The experiment was laid out in a randomized complete block design with factorial arrangements in 3 replications, consisted of 10 seedlings per treatment. The data regarding percentage sprouting, shoot length and percentage survival were computed and means were separated by Duncan's Multiple Range Test.

Results and Discussion

Data regarding percentage sprouting of grafted/budded plants during various months of operation showed that maximum sprouting of 93.33% was observed on July, 15 followed by June, 15 (Table 1). June, 15 and August, 15 were statistically at par with each others and gave sprouting of 81.7 and 79.98% respectively. April, 15 and September, 15 had occupied the intermediate position in this case. May, 15 resulted very low sprouting of 66.7% of propagated plants. Maximum sprouting of July, 15 and June, 15 in order of merit may be on account of maximum humidity prevailing during these months. Like-wise Ali and Haq (1973) reported that maximum sprouting of grafts during July and August months. In case of propagation methods T-grafting had performed better position over Chip budding where a maximum of 78.88% sprouting of grafts were noted. The higher sprouting in T-grafting may be due to that 6-8 buds (Scionwood) were used in operation instead of one bud in chip budding. In case of drying or browning of one bud that reduces the chance of the buddage plants to give out shoot.

Table 2 reveals that shoot length of grafted and budded plants on April, 15 and May, 15 was maximum and both of the treatments were Statistically at par with each others. April, 15 and May, 15 assumed a 24.65 cm and 23.65 cm shoot length respectively. June, 15 and July, 15 were also similar in production of shoot length. August, 15 had occupied an intermediate position and resulted 19.00 cm shoot length. Very shorter shoot of 14.81 cm was obtained in September 15. The data exhibited more or less persistently rhythmical manner for growth of shoot. It is quite understandable because the time given for the shoot to grow was relatively greater than the time given to other shoot.

Chip budding produced longer shoot of 24 cm than T-grafting. The longer shoot of chip budding may be due to that a single bud which resulted into a shoot will grow faster than a scion of 2-3 shoots regenerated in T-grafting.

Survival of grafted/budded plants in various months of operation shows that July, 15 got the maximum success of 81.66% (Table 3). The second best month was June, 15 where a 76.66% of success was noted. August, 15 got third position (71). September, 15 and April, 15 were statistically at par and resulted 68.33% success. Very low success of 63.33% was observed on May, 15.The present findings are similar (Mukherjee and Singh, 1965; Bhandary and Mukherjee, 1970; Ahmed, 1966; Khattak *et al*., 1993). They recommended that June, July and August are the better

Table 1: Percentage Sprouting of grafted/budded plants in guava (*Psidium guajava* L.) (Mean of two years)

Propagation methods	Months of Operation						
	April	May	June	July	August	Sept.	Treatments Means
T-grafting	73.3	66.7	76.7	93.33	86.66	76.86	78.88a
Chip budding	73.3	66.7	86.7	80.00	73.3	63.30	73.9b
Means of months	73.3c	66.7cd	81.7b	86.66a	79.98b	70.00c	

Means of months and propagation methods followed by different letters are significant at 5% level of probability

Table 2: Shoot Length (cm) produced by grafted/budded plants in guava (*Psidium guajava* L.) Mean of two years. (Mean of two years)

Propagation methods	Months of Operation						
	April	May	June	July	August	Sept.	Treatments Means
T-grafting	21.33	20.00	19.00	18.00	16.00	13.33	17.94b
Chip budding	28.00	27.31	26.00	24.30	22.00	16.3	24.00a
Means of months	24.65c	23.65cd	22.50b	20.15a	19.00b	14.81c	

Means of months and propagation methods followed by different letters are significant at 5% level of probability

Table 3: Percentage of Survival of grafted/budded plants in guava (*Psidium guajava* L.) (Mean of two years)

Propagation methods	Months of Operation						
	April	May	June	July	August	Sept.	Treatment means
T-grafting	66.66	63.33	73.33	86.66	80.00	76.66	74.44a
Chip budding	70.00	63.33	80.00	76.66	63.3	60.00	68.90b
Means of months	68.33cd	63.33e	76.66b	81.66a	71.65e	68.33cd	

Means of months and propagation methods followed by different letters are significant at 5% level of probability

months for guava propagation, because of maximum heat and humidity prevailing in these months. Survival percentage of success plants in between propagation methods showed that T-grafting presented a better success of 74.44%. T-grafting had shown a dominancy nearly for most of the parameters in the present study but from economic point of view chip budding is superior because of easy, quick and use of single bud instead of scion of 5-6 buds employed in T-grafting technique. The interaction between months of operation x propagation methods was found non-significant for all the parameters in the present trials.

References

Ahmad, R., 1966. Some study on the vegetative propagation of guava (*Psidium quajava* L.). West Pak. J. Agric. Res., 4: 68-79.

Ali, N. and I. Haq, 1973. A new method of vegetative propagation of guava (*Psidium guajava* L.). Pak. J. Agric. Res., 11: 69-77.

Ali, N., 1972. Studies on improvement of new grafting methods in guava. Pak. J. Agric. Sci., 9: 174-180.

Bhandary, K.R. and S.K. Mukherjee, 1970. Effect of season age and source of scionwood and ringing on veneer grafting of guava (*Psidium guajava* L.) Indian. J. Agric. Sci., 40: 495-501.

Bose, T.K., S.K. Mitra and M.K. Sadhu, 1991. Propagation of tropical and subtropical horticulture crops. Nava Prokash 206 Bidhan Sarani Calcutta, India, pp: 289-294.

Jaffee, A., 1970. Chip grafting guava cultivars. Plant Propagation, 16: 6-6.

Khattak, M.S., H. Inayatullah and S. Khan, 1983. Propagation of guava (*Psidium guajava* L.) from semi hard wood cuttings. Frontier J. Agric. Res., 8: 87-90.

Khattak, M.S., M.N. Malik and M.A. Khan, 1993. *In vivo* propagation of guava (*Psidium guajava* L.) through T-grafting. Pak. J. Agric. Sci., 30: 287-292.

Mukherjee, S.K. and Y.M. Singh, 1965. Effect of season and nature of shoot on veneer grafting of guava (*Psidium guajava* L.). Sci. Cult., 31: 31-33.

Samson, J.A., 1986. Tropical Fruits. 2nd Edn., Longman Scientific and Tech., Longman House, Burnet Mill, England, pp: 270-275.