

Effect of organic manures on growth of mango stone grafts

V. KRISHNAMOORTHY

Accepted : April, 2010

Correspondence to :

V. KRISHNAMOORTHY
Krishi Vigyan Kendra,
National Pulses Research
Centre, T.N.A.U.,
PUDUKKOTTAI (T.N.)
INDIA

ABSTRACT

An experiment was under taken at Department of Horticulture, Agriculture College and Research Institute, Tamil Nadu Agricultural University, Madurai (T.N.) during June 2007 to study the effect of different organic manures *viz.*, extracts of groundnut cake, gingelly cake, coconut cake, vermincompost at the rate of 50ml and 50g per epicotyl graft on 30days after grafting again repeated 3 times once in 30 days. The results revealed that application 10% extract of ground nut cake @ 50 ml exhibited vigorous growth by increasing inter nodal length, thickness of shoot, number of leaves, leaf length and leaf breadth and produced three flush in four months period. The plants also exhibited higher content of chlorophyll and soluble protein in the leaf.

Key words : Stone grafts, Groundnut cake, Gingelly cake, Vermicompost

Mango is one of the important fruit crop in India. It is cultivated in large area among the fruit crops. The area and production contributes 10 per cent of total fruit crops in India. India has the largest number of varieties and many are region specific. The choice varieties cultivation has been recently increasing as its fruits has good price in domestic and export market. Because of this recent trend, demand for choice varieties grafts is increasing every year. Among the choice varieties cultivated in India, Alphonso, Banganapalli and Imampasand has got more demand from growers. Mango propagated by many vegetative propagation methods especially grafting. In Tamil Nadu most successful method of grafting is approach grafting. This method gives high success and growth rate in nursery and establishment rate in main field. Propagation by this method needs more of mother plants in the nursery. Hence the stone / epicotyl method of grafting was under taken for large scale production of grafts and the growth of scion after grafting was very slow. Since the grafting should be done before detachment cotyledon otherwise before turning of leaves into green is one of the limiting factor of this method. Hence, grafting should be done one or two days after potting. Since the feeder roots with root hairs are get damaged while lifting from the field, the growth of shoot after grafting is very slow. Some times establishment in the main field was very low. Hence, the present study was under taken to study the growth of shoots grafted on potted and direct sown root stocks.

MATERIALS AND METHODS

The present study was under taken at Department of Horticulture, Agriculture College and Research Institute, Madurai during June 2007. The study was

conducted with root stock raised by two methods *viz.*, sowing the seeds in field, after germination lifted and potted in polythene bags and in other method the stones directly sown in poly bags. The fresh Alphonso seeds were collected, washed with water and dipped in 0.2% carbendazim and monocrotophos, and then the sowing was taken up. The germinating stones having pencil thickness was selected and grafted with scion collected from current season matured shoots of Banganappalli. Before grafting the scion were dipped in 0.2% carbendazim and monocrotophos pesticide solution. The scion was grafted with polythene strip and covered with polythene cap. The grafted materials were kept inside 70% shade net house. Daily watering, removal of shoots in root stock were done periodically. After the emergence of leaves, the cap was removed and grafts were placed in open places having partial shade under trees. After one month of grafting to encourage the growth of shoots the following treatments were given. 10 per cent extract of ground nut cake, gingelly cake and coconut cake were prepared and 50ml of this extract was poured to each grafts. The vermicompost at the rate 50g per plant was applied to grafts. It was applied 30 days after grafting and repeated once in month for three times. 100 grafts per treatment were maintained and replicated four times. The grafts were arranged in completely randomized design. The leaf area, total chlorophyll and soluble protein content in the leaves were estimated by following the methods suggested by Murray (1960), Yoshida *et al.* (1971) and Lowry *et al.* (1951), respectively. The growth of grafts measured in terms of shoot length and girth, number of leaves per flesh, no of flesh in six month period.

Table 1: Effect of organic manure on growth parameters of mango grafts at 150 days after grafting

Treatments	Shoot length	Shoot girth	No. leaves / flesh	Total no. of flesh	Leaf area (cm ³)	Total chlorophyll (mg/g)	Total soluble protein (µg/g)
Groundnut cake extract	16.43	2.50	9.0	3.0	17.50	2.21	1.23
Gingelly cake extract	12.22	2.10	8.0	1.0	11.76	1.98	1.12
Coconut cake extract	8.56	1.62	6.0	1.0	8.65	1.82	1.02
Vermicompost	9.14	1.74	6.0	1.0	8.32	1.88	1.08
Control	6.64	1.42	6.0	1.0	7.56	1.54	0.92
C.D (P=0.01)	1.10	0.62	1.2	0.5	1.08	0.78	0.24

RESULTS AND DISCUSSION

The result of the experiment reveal that there was no second flesh production in the grafts produced by using germinating stones collected from field and potted in poly bags. The observation of root system indicates that tap root was broken after 10 cm length and there were no feeder roots with root hairs. Whereas in case of stones sown directly in poly bag there was a good tap root with feeder roots. There were more than 50 per cent of grafts dried in six month duration. In case of direct sown rootstock it was less than five per cent. The growth performance of grafts in response to application of organic manures is given in Table 1. The results revealed that among the various organic manure, application of 10 per cent groundnut cake solution exhibited higher growth rate in terms of shoot length (16.43 cm) and girth (2.50cm), number of leaves per flesh (9.0) and more than three number flesh in six month period. It may be due to the presence of all the major and minor nutrients in the solution might favoured better growth of grafts. Similar results were reported in jack and cashew grafts growth by Selvi *et al.* (2008). Higher leaf area (17.50), total chlorophyll content (2.21mg/g) and total soluble protein (1.23micro g/g) in leaves were recorded in grafts applied with 10 per cent groundnut cake extract. The lowest shoot length

(6.64cm) and girth (1.42cm), number of leaves per flesh (6.0) and total number flesh (1) in six month period, leaf area (7.56), total chlorophyll content (1.54) and total soluble protein content (0.92) were recorded in control.

REFERENCES

- Lowry, O.H.**, Rosebrough, J., Farr, L.A. and Randal, R.J. (1951). Protein measurement with folin phenol reagent. *J. Biol. Chem.*, **193**: 265-275.
- Murray, D.B.** (1960). The effect of deficiencies of the major nutrients on growth and leaf analysis of the banana. *Trop. Agric. Trinidad*, **37**: 97-106.
- Selvi, R.**, Kumar, N., Selvarajan, M. and Anbu, S. (2008). Effect of environment and month of grafting success in jack fruit. *Indian J. Hort.*, **65**: 343-334
- Yoshida, S.**, Forno, D.A., Cook, J.H. and Gomez, K.A. (1971). *Laboratory Manual for Physiological studies on Rice*, IRRI, Manila, Philippines, p.82.
