



RESEARCH ARTICLE

STUDY THE SUCCESS PERCENTAGE OF STONE GRAFTING IN MANGO VARIETIES ON LOCAL ROOTSTOCK

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ABSTRACT

The experiment to investigate the success percentage of grafting in eleven mango varieties on local rootstock was conducted with randomized block design with three replications at Tansa farm of ASPEE, Agricultural Research and Development Foundation, Maharashtra in Israel and Indian varieties in August 2024. The results of the investigation clearly showed that the highest grafting success percentage was received in Israel and Indian varieties like Lilly, Tommy Atkins, Kent, Amrapali, Hapus, Rajapuri, Kesar and Baramashi scion varieties under stone grafting, with the lowest in Totapuri variety.

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INTRODUCTION

Mango is botanically called *Mangifera indica* L, belonging to the *Anacardiaceae* family. More than 1000 varieties are grown throughout India. It is a rich source of vitamin A (4800 IU), minerals and enzymes. Like recommended varieties, mono-embryonic mango varieties have a single embryo of hybrid origin and are not true seed-producing. They are propagated by grafting onto the rootstock of the plant. Poly-embryonic mango varieties, like the so-called mango or Hawaiian mango varieties, produce two or more nuclear (maternal) root plants from each seed.

Poly-embryonic mango varieties can be grown from seed without the need for any kind of grafting. Grafted trees grow more slowly than seedling trees and are often smaller. Grafted trees in arid regions usually bear fruit in 3 to 5 years, while seedling trees usually take at least five years to bear fruit. Mango trees can remain in production for 40 years or more. Mangoes are not propagated by cuttings or air layering because the resulting trees have weak roots (Jadhav et al., 2014). Methods used in India are softwood grafting, inarch grafting, veneer grafting, and approach grafting, etc.

METHODOLOGY

At ASPEE, Agricultural Research and Development Foundation, Tansa Farm, experiment on "study the success percentage of stone grafting in mango varieties on local rootstock" was carried out with eleven treatments and 3 replicates during August 2024. Fresh mango kernels/seeds were collected from mango orchards of ASPEE, ARDF, Tansa Farm, Wada, District Thane. The collected local stones were washed with running water. 12-14 days old, 20-22 cm height seedlings were taken out from the bed and used for the purpose of rootstocks. Scions of desired Israel and Indian varieties like Tommy Atkins, Kent, Kinth, Lily, Hapus, Rajapuri, Ratna, Totapuri, Kesar, Amrapali and Baramashi were selected at ASPEE, ARDF's Tansa farm. The size of the polythene bag used is 10"x6". The bag is filled with 1:1:2 proportional mixture of soil, sand and vermicompost. For normal grafting, rootstocks having reddish-copper coloured leaves, pencil size thickness were selected. Rootstocks and scions free from insects, pest and diseases affected material etc. were selected. Grafted plants were kept in polyhouse. Five plants were taken per replicate per treatment.

Grafted plants were irrigated daily in the morning and evening as per water requirement (Anonymous, 2011; Perez et al., 2011 and Jadhav et al., 2014).

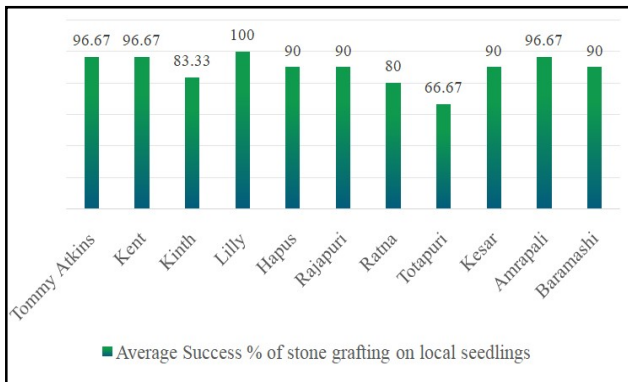


Figure 1. Grafting success percentage of eleven mango varieties on local rootstock seedlings at ASPEE, ARDF's Tansa farm

Table 1. Grafting success percentage of eleven mango varieties on local rootstock seedlings at ASPEE, ARDF's Tansa farm

Sr No	Variety	Average Success % of Stone grafting
1	Tommy Atkins	96.67 _{ab}
2	Kent	96.67 _{ab}
3	Kinth	83.33 _{bc}
4	Lilly	100 _a
5	Hapus	90 _{abc}
6	Rajapuri	90 _{abc}
7	Ratna	80 _{cd}
8	Totapuri	66.67 _d
9	Kesar	90 _{abc}
10	Amrapalii	96.67 _{ab}
11	Baramashi	90 _{abc}
C.D. @ 0.05		16.59*
CV (%)		10.93

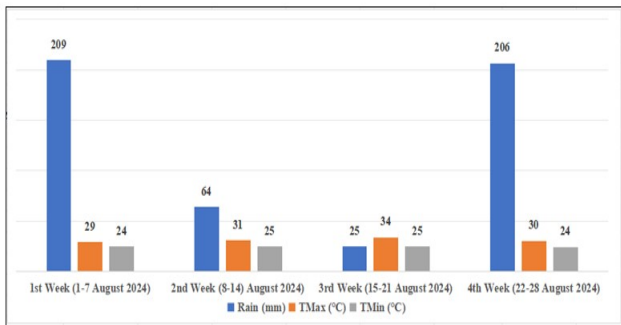


Figure 2. Weekly total Rainfall (mm) and average Temperature (TMax. & TMin. (°C)) of August 2024

Care the Seedling after Stone Grafting: First of all, the grafted plant is very vulnerable. Even if it is well grafted, if it is not properly cared for, the graft may fail and all the work will be wasted. The grafted seedling should not be touched or moved. The grafted seedling needs a lot of water. However, watering from above cannot be done as the falling water will shake the seedling and the graft may break. It is important to keep the plant in a humid environment (Jadhav et al., 2014).

RESULTS

In the present investigation, grafting compatibility success percentage was found to be significant on local seedlings at Tansa farm of ASPEE, ARDF, with highest percentage recorded in scion variety likes Lilly (100 %), and statistically at par with Tommy Atkins (96.67 %), Kent (96.67 %), Amrapali (96.67 %), Hapus (90 %), Rajapuri (90 %), Kesar (90 %) and Baramashi (90 %). While, the lowest grafting compatibility percentage success was recorded in Totapuri (66.67 %) variety (Figure 1 and Table 1). The success of graft compatibility percentage depends on scion and rootstock size, rootstock sprout, graft union area, age of scion and rootstock, attack of insects, pests and diseases on plant material, hormonal imbalance, nutritional imbalance, climatic condition, cambium thickness, etc. (Jadhav et al., 2014). The success of graft compatibility percentage may be due to favourable weather conditions (Figure 2) for scion and rootstock compatibility in August, high cambium activity, favourable hormonal and enzyme levels in scion and rootstock etc.

CONCLUSION

The data clearly showed that the month of August is must favourable for grafting mango varieties like Lilly, Tommy atkins, Kent, Amrapali, Hapus, Rajapuri, Kesar and Baramashi on selected local seedlings at ARDF’s Tansa Farm.

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