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Research Note

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Effect of pre-sowing treatment of kernels on graft success of mango (*Mangifera indica* Linn.)

■ **A. HIMA BINDU**[1] AND **D. SRIHARI**

Members of the Research Forum

Associated Authors:
[1]Dr. Y.S.R. Horticultural University, Venkataramannagudem, WEST GODAVARI (A.P.) INDIA
Email : himabindu2911@gmail.com

Author for correspondence :
D. SRIHARI
Dr. Y.S.R. Horticultural University, Venkataramannagudem, WEST GODAVARI (A.P.) INDIA
Email : sriharidevara@yahoo.co.in

ABSTRACT : To assure the availability of quality planting material in a short period of time with maximum graft success, a study was conducted at College of Horticulture, Rajendranagar by utilizing cv. Totapuri and cv. Alphonso as rootstock, Baneshan as scion and by employing soft wood grafting during 2010-11. An experiment was laid out in randomized block design with pre-sowing treatments of kernels with KNO_3 at 0.5 %, KNO_3 at 1 % and control in cv. Totapuri and cv. Alphonso. The results revealed that extracted kernels pre-treated with KNO_3 at 0.5 % in cv. Totapuri recorded best results *viz.*, early sprouting of buds on scion (17.44 days), maximum graft success (73.66%), more number of flushes per scion (2.42), more number of leaves (17.98), maximum diameter at graft union (8.55 mm) and maximum height of the graft (28.78 cm).

KEY WORDS : Alphonso, GA_3, Graft success, KNO_3, Mango, Totapuri

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Mango (*Mangifera indica* Linn.), is one of the most important fruits for all sections of people in India. The area under mango is increasing rapidly owing to great demand for fresh fruits as well as processed products in the international market. However, the greatest bottleneck in the expansion of area under fruits is the non-availability of genuine and quality planting materials in adequate quantity from reliable nurseries. Healthy and good quality plant material is the foundation for successful fruit industry in the country (Reddy and Shukla, 2007). Synchronization and rapid seedling emergence are the commonly reported benefits of pre-sowing treatments on germination. To attain maximum graft success, pre-sowing treatments are very important which influences the growth, vigor, longevity, tree size, yield and quality. Organized research work in these lines is not available in mango cv. Totapuri and Alphonso as rootstocks and hence, the present research work has been designed.

The work was conducted during 2010-11 to study the influence of pre-sowing treatments on graft success of mango on rootstocks of cv. Totapuri and cv. Alphonso. Extracted kernels of cv. Totapuri and Alphonso were pre-treated with KNO_3 at 0.5 %, KNO_3 at 1 % and control (without any pre-sowing treatment) for 12 hours. Rootstocks of 60-70 days old which were healthy, vigorous, uniform in growth and having bronze colored leaves were used for grafting. Softwood grafting was employed using the scions from the 3-4 months old shoots of mango cv. Baneshan trees which were about 8 to 10 years old. Precured scions of size 15- 18 cm long and having plumpy bud at terminal were separated on the day of grafting. The grafts were watered daily as and when required. New sprouts arising from the rootstocks were removed regularly. The observations were recorded four months after grafting on graft success, number of flushes per scion, number of leaves, diameter at graft union and height of the graft.

Significant differences were observed among the treatments. Early sprouting of buds (17.44 days) was noticed in rootstock cv. Totapuri with KNO_3 at 0.5 % which was significantly superior to other treatments (Table 1). The varietal differences in the response to the treatments were also significant, with Totapuri exhibiting early sprouting than Alphonso. This might be due to good vigor of Totapuri rootstock and scion compatibility with Baneshan resulted in early sprouting of buds. These results are in conformity with Patel and Amin (1981) in mango.

Maximum graft success was observed in KNO_3 at 5.0 % (73.66 %) in cv. Totapuri (Table 1). Significantly least graft success was observed in control (61.41 %). The influence of weather parameters like humidity and temperature on graft

Table 1 : Effect of pre-sowing treatments on days taken for sprouting of buds on scion, graft success and number of flushes per scion of mango

Name of the cultivar	Treatments	Days taken for sprouting of buds on scion	Graft success (%)	Number of flushes/ scion
Totapuri	KNO_3 @ 0.5 %	17.44[a]	73.66[a]	2.42[a]
	KNO_3 @ 1.0 %	20.50[c]	68.70[c]	2.12[c]
	Control	24.60[e]	64.50[e]	1.82[e]
Alphonso	KNO_3 @ 0.5 %	18.94[b]	71.57[b]	2.27[b]
	KNO_3 @ 1.0 %	22.50[d]	66.36[d]	1.97[d]
	Control	26.90[f]	61.41[f]	1.67[f]
	S.E.+	0.43	0.49	0.02
	C.D. (P=0.05)	1.31	1.51	0.07

Table 2 : Effect of pre - sowing treatments on number of leaves, diameter at graft union and height of the graft of mango at 120 days after grafting

Name of the cultivar	Treatments	Number of leaves	Diameter at graft union	Height of the graft
Totapuri	KNO_3 @ 0.5 %	17.98[a]	8.55[a]	28.78[a]
	KNO_3 @ 1.0 %	14.17[c]	8.42[c]	26.40[c]
	Control	11.72[e]	8.06[e]	24.17[e]
Alphonso	KNO_3 @ 0.5 %	15.88[b]	8.50[b]	27.60[b]
	KNO_3 @ 1.0 %	13.62[d]	8.27[d]	25.20[d]
	Control	11.26[f]	7.77[f]	23.06[f]
	S.E.+	0.01	0.01	0.05
	C.D. (P=0.05)	0.03	0.03	0.16

survival might have given higher graft success by encouraging proper callus formation and strong union between the stock and scion. Similar results were reported by Patel and Amin (1981).

In cv. Totapuri, maximum number of flushes per scion (2.42) was observed with KNO_3 at 0.5 % which was significantly superior to other treatments (Table 1). It could be attributed to weather conditions at the time of grafting season leading to more accumulation of food material of the stored metabolites. The results are in agreement with Santosh (2004) in mango.

The treatment with KNO_3 at 0.5 % produced maximum number of leaves (17.98) in mango cv. Totapuri (Table 2). This might be related to vigorous growth of grafts induced by simulative organs and also influenced by maximum number of sprouts leading to maximum number of leaves (Kumar *et al*., 2008).

The maximum graft diameter (8.55 mm) was recorded with KNO_3 at 0.5 % in cv. Totapuri (Table 2). It could be attributed to enhanced uptake of nitrogen, potassium, water and nutrients leading to more accumulation of food material of the stored metabolites as reported by Sappandi (2005) in wood apple and Devachandra, (2006) in jamun.

KNO_3 at 0.5 % recorded maximum height of the graft (28.78 cm) in mango cv. Totapuri (Table 2). This might be due to better growth of rootstocks and weather conditions like temperature and humidity which played an important role in vegetative growth of grafts. The results are in conformity with Patel and Amin (1981) and Kumar *et al.* (2008) in mango.

Totapuri kernel pre-treated with KNO_3 at 0.5 % proved to be best in improving graft success of mango. This practice can be used routinely to improve the germination and graft success of mango. The results have far reaching positive implications for rural prosperity.

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