

Original Research Article

Effect of Time and Colour polycap of Wedge Grafting for Quality Production of Nursery Plants of Mango (*Mangifera indica* L.) var. Amrapali

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ABSTRACT

The experiment was conducted at Horticulture complex maharajpur, J.N.K.V.V, Jabalpur (M.P.), during 2017-18, the effect of time and polycap on wedge grafting in mango (*Mangifera indica* L.) cv. Amrapali, the experiment was carried out to find the response of Amrapali mango to time (20th July, 10th August and 20th August) and colours polycap (Without colour, white colour, Red colour and Green colour) of wedge grafting. Studies revealed that wedge grafting with Red colours polycap performed on 10th August recorded minimum time (10.45 days) for bud sprouting and maximum number of leaf (7.33 and 9.33) and maximum height of grafted plant (20.16cm and 21.33cm) and minimum in control at 30 and 60 days after grafting, whereas red colour polycap performed on 10th August was found to be the best time in terms of sprouting percentage after one (78.62%) and six (70.30 %) month of grafting. Therefore, red colours polycap should be preferred over white colours polycap, green colours polycap and control in order to get better survival and over all sprout growth for commercial propagation of quality plants of Amrapali mango.

Keywords

Mango, Colours polycap, Wedge grafting and Amrapali

Introduction

Mango (*Mangifera indica* L.) is a most important tropical and subtropical fruits grown in more than 110 countries of the world. It belongs to the family Anacardiaceae. History indicates that Indian mango cultivation is very ancient, of about 4000 years old. It is most popular, the choiest fruit and occupies a prominent place among the fruits of the world. Three main centres of distribution of mango were suggested viz., the India-burma-Siam area, the Philippines,

and the malaypeninshula, with emphasis on the Indo –Burma region (Mukherjee,1967). Howere the north eastern India, the Indo-Myanmar border region and Bangladesh is considered as centre of region of mango (Candolle, 1904). It is highly productive, delicious and nutritious fruit grown commercially throughout sub-tropical and tropical regions of India. In India it occupies an area of 2515.97 thousand hectare with a total production of 184031.33 thousand million tones. In which Madhya Pradesh occupies 332.97 hectare and production of

3163.32 million tonnes (Anonymous, 2016-17). Mango is grown in all districts of M.P., but the maximum average is in Jabalpur, Rewa and Satna.

Mango is a highly nutritive fruit. Immature and green mature fruits are suitable for pickling and chutney preparation due to the acidic nature. Ripe mangoes are excellent table fruits and also can be transformed into a variety of products. Mango pulp is the most important which is utilized for human consumption, fruit pulp predominates in water, carbohydrates, organic acids, fats, minerals, pigments, tannin, vitamins. The ripe fruits pulp contains about 11.8 percent carbohydrates, 4800 IU of vitamin A, and 13 mg/100 mg ascorbic acid. The pulp is a rich source of beta carotene, sucrose, glucose and fructose. In ancient days, mango was mainly propagated by seeds. But with the advancement in the technology of propagation, now it has become easy to propagate mango by different vegetative methods. Such as layering, budding or grafting. The original seedling trees of such superior mango varieties are reported to be still alive and possibly many such trees are in existence in different parts of the country. The occurrence of such promising types is relatively infrequent as mango is essentially cross-pollinated.

Materials and Methods

The present investigation was conducted at Horticulture complex maharajpur, J.N.K.V.V, Jabalpur (M.P.), during 2017-18. The experiment was carried out in factorial RBD with three replications in each treatment. There were four type colours polycap in each replication of all 7 treatment combinations. The treatment combinations were comprised of three time of grafting i.e. (20th July, 10th August and 20th August) with one method of grafting *viz*, wedge grafting (softwood

grafting). The techniques as suggested by Mukherjee and Majumdar (1961) and Desai and Patil (1984) were followed for performing veneer and softwood grafting, respectively. The epicotyl grafting was performed by wedge technique as suggested by Mujumdar and Rathore (1970). One to two months old healthy scion shoots having 0.4 cm thickness and 8.0 cm length were selected from current season growth of mother tree of Amrapali. The selected scion shoots on mother plants were defoliated eight days before the actual operation and were detached from mother plant just prior to grafting operation. All colours polycap were performed on 20th July, 2017, 10th August, 2017 and 20th August, 2017. The grafting operation was completed on the same day.

Root stock

The mango stones of unknown commercial cultivars were used for raising seedling rootstocks for grafting. These stones were sown in black poly bags. Softwood grafting were performed on one-year-old seedlings. The media used for filling of poly bags consisting of soil, sand and FYM in the ratio of 1:1:1. Just after sowing of mango stone, watering was done with the help of sprinkler. The poly bags were then kept in net house.

Results and Discussion

Effect of time and colours polycap of wedge grafting on days taken for bud sprouting in mango grafts after grafting

The interaction effect of time and colours polycap of wedge grafting indicated that earliest sprouting was observed when red colours polycap was performed on 10th August (10.45 days) and latest sprouting was observed when wedge grafting (softwood grafting) was performed on 20th July (12.20 days) and 20th August was performed (15.30

days) (Table 1). The interaction between time and colours polycap of wedge grafting on days taken for bud sprouting was also found to be significant. The findings of the current study are in accordance with the findings obtained by Singh *et al.*, (2012) who observed earliest sprouting when grafting was done during wet season (July and August), while latest sprouting was recorded in September. Similarly, Islam and Rahim (2010) observed maximum time for bud sprouting (11.07 days) when grafting was done on 26 August, while, it was minimum (10.12 days) when grafting was performed on 6 August.

Effect of time and colours polycap of wedge grafting on number of leaf after 30 days of grafting

The maximum number of leaves after 30 days of grafting (7.33, 5.83 and 5.00) was recorded when grafting was performed on 10th August followed by 20th July and 20th August with red colours polycap (Table 2). Among the treatments, red colours polycap recorded the maximum per cent success followed by green colours, white colours and minimum in control (4.33, 4.16 and 3.66) (without colours). Kudmulwar *et al.*, (2008) performed grafting under Parbhani condition using local variety rootstock of custard apple (*Annonasquamosa* L.) with Balanagar scion and reported the highest number of leaves (21.93) in plants produced after grafting.

Effect of time and colours polycap of wedge grafting on number of leaf after 60 days of grafting

The maximum number of leaves after 60 days of grafting (9.33, 7.83 and 7.33) was recorded when grafting was performed on 10th August followed by 20th July and 20th August with red colours polycap (Fig.1). Among the treatments, red colours polycap recorded the maximum per cent success followed by green

colours, white colours and minimum in control (6.66, 6.00 and 5.83) without colours.

The research worker has also reported the observation Ram *et al.*, (2012) recorded the maximum number of leaves on Amrapali scion at 30 and 60 days after stone grafting on different cultivars of mango.

Effect of time and colours polycap of wedge grafting on height of grafted plant after 30 days of grafting

The maximum plant height of grafted plant after 30 days of grafting (20.16cm, 19.00cm and 17.83cm) was recorded when grafting was performed on 10th August followed by 20th July and 20th August with red colours polycap (Fig.2). Among the treatments, red colours polycap recorded the maximum per cent success followed by green colours, white colours and minimum in control (17.83cm, 16.00cm and 15.16cm) without colours. These results are also correlated with Chandan *et al.*, (2006) (Table 2).

Effect of time and colours polycap of wedge grafting on height of grafted plant after 60 days of grafting

The maximum plant height of grafted plant after 60 days of grafting (21.33cm, 20.03cm and 18.83cm) was recorded when grafting was performed on 10th August followed by 20th July and 20th August with red colours polycap (Fig.3). Among the treatments, red colours polycap recorded the maximum per cent success followed by green colours, white colours and minimum in control (18.83cm, 17.00cm and 16.66cm) without colours. A significant varietal differences were also observed Sivudu *et al.*, (2014) stated that Banganapalli grafted on Bangalora rootstock recorded the maximum graft height under Anantharajupet conditions. And these results also correlated with Kumar *et al.*, (2012).

Fig.1 Effect of time and colours polycap of on number of leaves

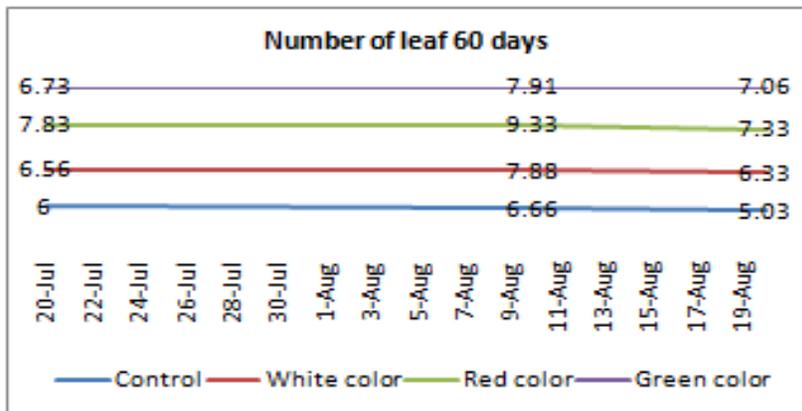


Fig.3 Effect of time and colours polycap on height

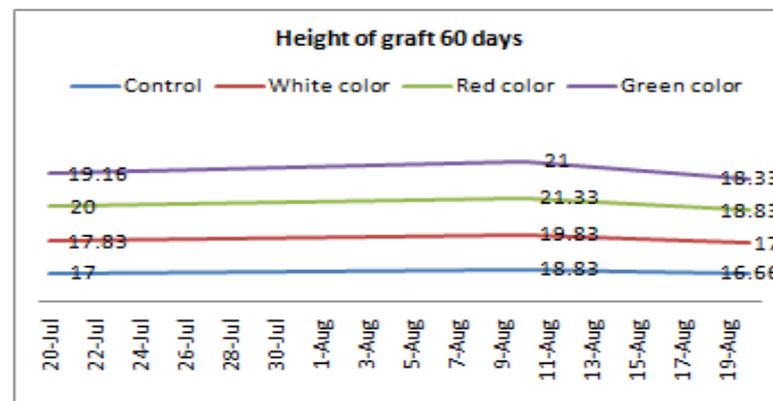


Fig.2 Effect of time and colours polycap on height

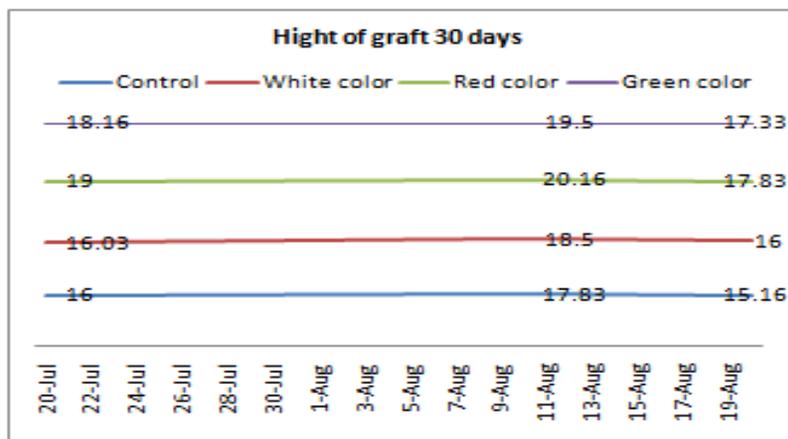


Fig.4 Effect of time and colours polycap on per cent success

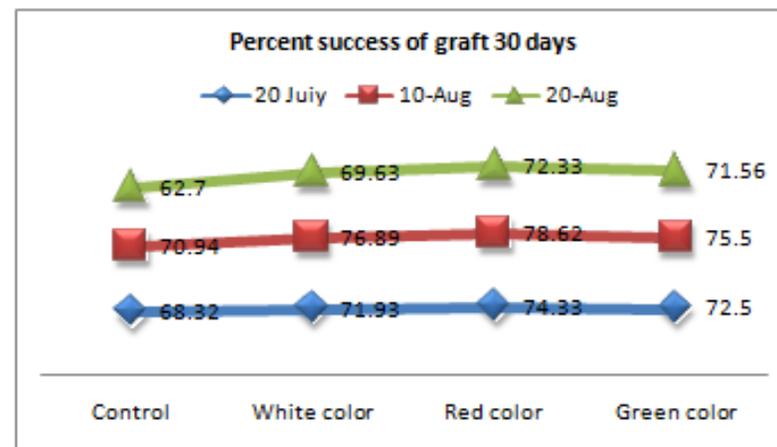


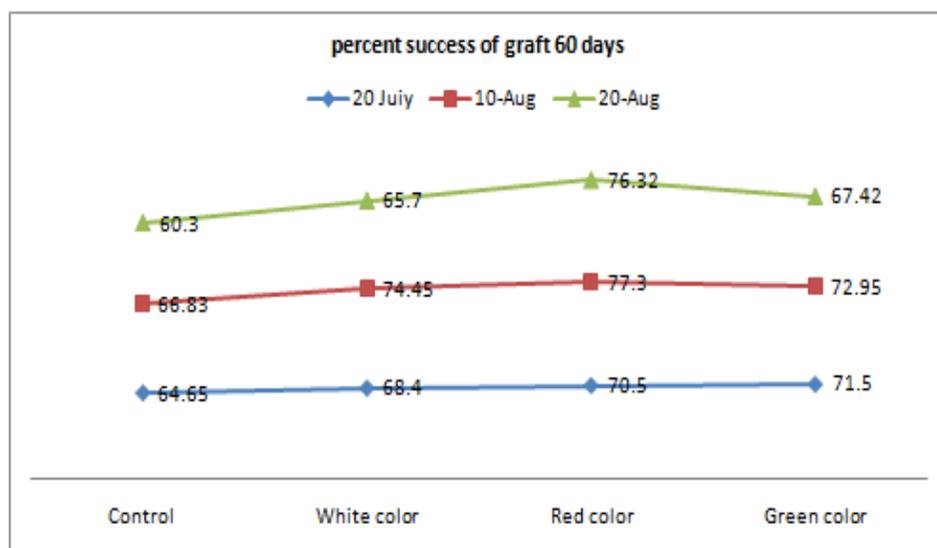
Table.1 Effect of time and colours polycap of wedge grafting on days taken for bud sprouting after grafting

Treatment	20-Jul	10-Aug	20-Aug	Mean
Control	15.11	14.00	20.00	16.37
White colour	13.03	12.00	17.53	14.19
Red colour	12.20	10.45	15.30	12.65
Green colour	14.30	12.62	17.89	14.94
Mean	13.66	12.27	17.68	
C.D. at 5%	0.32	0.02	1.26	
Intrraction	0.45	0.03	1.78	

Table.2 Effect of time and colours polycap of wedge grafting on number of leaf after 30 days of grafting

Treatment	20-Jul	10-Aug	20-Aug	Mean
Control	4.16	4.33	3.66	4.05
White colour	4.66	6.00	4.00	4.88
Red colour	5.83	7.33	5.00	6.05
Green colour	4.83	6.58	5.00	5.47
Mean	4.87	6.06	4.41	5.11
CD	0.61	0.76	0.58	
Intrraction	0.78	0.89	0.96	

Fig.5 Effect of time and colours polycap on per cent success



Effect of time and colours polycap of wedge grafting on per cent success in mango grafts after one months of grafting

The maximum per cent success after one month of grafting was observed when grafting was performed on 10th August followed by 20th July and 20th August with red colours polycap (Fig.4).

Among the treatments, red colours polycap recorded the maximum per cent success followed by green colours, white colours and minimum in control (without colours).

The interaction effect of time and colour polycap of wedge grafting indicates that the maximum per cent success was observed in cover red polycap when performed on 10th August (78.62%) and minimum per cent success was observed in without polycap when performed on 20th August (62.70%).

The interaction effect between time and colours polycap of wedge grafting on per cent success were also found to be significant.

Effect of time and colours polycap of wedge grafting on per cent success in mango grafts after six month of grafting

The highest per cent success after six month of grafting was recorded when grafting operation was performed on 10th August with graft cover red polycap followed by 20th July and 20th August (Fig. 5). The interaction effect of time and colours polycap of grafting on per cent success was highest when red colours polycap was performed on 10th August (77.30%) while as per cent success was least when without polycap (control) was performed on 20th August (60.30%). The interaction between time and colours polycap of grafting on per cent success were found to be significant.

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