*Biological Forum – An International Journal* **15(10): 1068-1073(2023)**

**ISSN No. (Print): 0975-1130**
**ISSN No. (Online): 2249-3239**

# Influence of Scion Dip Treatments and Growing Condition on Success and Survival of Mango (*Mangifera indica* L.) Wedge Graft cv. Dashehari

***Lokesh Nagar[1], C.S. Pandey[2*], Sandeep Raipuriya[3], S.K. Pandey[4], Bhavana Mishra[1] and Vishesh Patel[3]***
*[1]M.Sc. (Ag.) Horticulture, Department of Horticulture, JNKVV Jabalpur (Madhya Pradesh), India.*
*[2]Scientist-Horticulture, Department of Plant Physiology, JNKVV Jabalpur (Madhya Pradesh), India.*
*[3]Ph.D. Scholar, Department of Horticulture, JNKVV Jabalpur (Madhya Pradesh), India.*
*[4]Professor and Head, Department of Horticulture, JNKVV Jabalpur (Madhya Pradesh), India.*

*(Corresponding author: C.S. Pandey*)*
*(Received: 12 August 2023; Revised: 17 September 2023; Accepted: 02 October 2023; Published: 15 October 2023)*
*(Published by Research Trend)*

**ABSTRACT: The experiment was conducted to find out the effect of IAA, BAP, $ZnSO_4$ and growing condition on the growth, vigour and survival of mango (*Mangifera Indica* L.) grafts cv. Dashehari at Fruit Research Station Imaliya, Department of Horticulture, JNKVV Jabalpur. In India, there are variety of propagation techniques accessible, including softwood, veneer grafting, side grafting, and epicotyl grafting. Various aspects, including weather conditions, different types of mango cultivars, specific growth seasons, age of shoots and rootstocks, scion wrapping method, shoot maturity, and rootstock quality, all influence the outcomes and viability of mango grafting. The experiment was carried out in Factorial Completely Randomized Design (FCRD) during September 2022 to January 2023. The data showed that among different treatments BAP 40 ppm + $ZnSO_4$ 500 ppm under open condition was found to be most effective for days taken to sprout initiation with minimum 8.00 Days and for sprouting percentage with maximum values (76.66 and 77.66%) at 30 and 60 days. While the IAA 200 ppm + $ZnSO_4$ 500 ppm under shade net condition was found best in respect to maximum number of leaves (8.66 and 13.66) and survival percentage (73.33% and 74.33%) at 90 and 120 days. It is concluded from the research that Indole acetic acid (IAA) in combination with $ZnSO_4$ under the shade condition is preferred for wedge grafting in late rainy season cv. Dashehari.**

**Keywords:** Wedge graft, Scion, Sprout Initiation, IAA, BAP, Shade net, Dashehari.

## INTRODUCTION

Mango (*Mangifera Indica* L.) has become a major fruit crop of the tropics and subtropics, particularly in Asia, where the mango has always been the most important fruit crop and where it has been considered the 'king of fruits' (Purseglove, 1972). It is the native of Indo-Burma region (De Candole, 1904; Mukherjee, 1951). The inflorescence of mango is small to broad conical panicles up to 45 cm and the color of the panicle may be light green, yellowish green with patches on branches. Mango is highly cross pollinated and heterozygous plant. The male and hermaphrodite flowers are in the panicle. During flowering and fruit development, high humidity causes reduction in fruit yield. mango is one of the important species among the 73 genera of the family Anacardiaceae in Sapindals order. It originates from the Indo-Burma region, with 41 recognised mango species, which originate as a resinous and fibrous forest tree (Mukherjee, 1951 and 1967). It is recorded that as many as 69 wild species of *Mangifera* are distributed throughout the world and 11,595 cultivars are available in the world. India is proud of having the largest germplasm wealth of mango with about 1000 cultivars. All the cultivated Indian mangoes belong to the species *Mangifera indica*. Mango is successful commercial fruit in tropical and sub-tropical regions (Millington, 1984).

India ranks first among the world's largest mango producing country accounting for about 45.14% of the world's total mango production. As per National Horticulture Board statistics (Anonymous 2021) final estimate. India produces 20386 thousand metric ton from the area of 2317 thousand hectare. As per the National horticulture board statistics, Uttar Pradesh is the largest producer of mango with annual production 4806.65 thousand ton and 23.58 % production share. Andhra Pradesh is the second largest mango producer in India.

Vegetative propagation such as grafting is a technique to maintain true to type of a given variety that enables to transfer quality parameter from mother to offspring (Nakasone & Paull 1998). Grafting is an ancient horticultural technique that is indispensable to modern horticulture for unlocking the benefits of grafted trees. the technique that enables us to exploit the various advantages of grafted trees. The success of any graft union depends on the establishment of callus bridge between the cut surface of scion and stock. The plant growth regulators such as auxin and cytokine in induce

the initiation and proliferation of callus and new vascular tissue by promoting cell division and or cell development (Ghosh and Bera 2015). Zinc regulates the activity of sucrose synthase and aldose activity which in turn regulates the formation of sucrose. Zinc also plays a role in metabolism of starch and aid in translocation of sucrose through phloem loading of sucrose (Brown *et al.,* 1993). Considering these facts in mind, present investigation was carried out the assess the growth and success of wedge grafts of Mango.

## MATERIALS AND METHODS

The present investigation was carried out at Fruit Research Station Imaliya, Department of Horticulture, College of Agriculture, JNKVV Jabalpur (M.P.) during the period of September 2022 to January 2023. The experiment was laid out in a factorial completely randomized design with three replications. The experiment was comprised of two factors *i.e.*, (A) Scion dip treatment i.e. IAA 100 ppm + $ZnSO_4$ 250 ppm ($T_2$), IAA 100 ppm + $ZnSO_4$ 500 ppm($T_3$), IAA 200 ppm + $ZnSO_4$ 250 ppm ($T_4$), IAA 200 ppm + $ZnSO_4$ 500 ppm($T_5$), BAP 20 ppm + $ZnSO_4$ 250 ppm($T_6$), BAP 20 ppm + $ZnSO_4$ 500 ppm($T_7$), BAP 40 ppm + $ZnSO_4$ 250 ppm($T_8$), BAP 40 ppm + $ZnSO_4$ 500 ppm($T_9$) and no use of PGR – Control($T_1$) and (B) Growing conditions (Shade net and Open condition) of grafted plants. The observations were recorded on the time taken to sprout initiation, sprouting percentage at 30 and 60 days, number of leaves at 90 and 120 days and survival percentage at 90 and 120 days. The statistical technique and data analysis in this study were conducted utilising the methodology proposed by Panse and Sukhatme (1985).

The number of days required for sprouting of grafts were counted from date of grafting till the sprout to come out in each replication of treatment. Total number of leaves was counted on each selected 5 grafts at 90 and 120 days after grafting and then mean number of leaves per grafts was calculated. The sprouting percentage of grafts was calculated treatment and replication wise. Sprouting percentage was calculated by using following formula

$$\text{Sprouting percentage} = \frac{\text{Total no. of graft sprouted}}{\text{Total no. of graft prepared}} \times 100$$

After grafting, the number of plants that have survived is appropriately reported when there is a "successful union between rootstock and scion" in addition to the sprouting of scion shoots

$$\text{Survival percentage} = \frac{\text{Total number of grafts survived}}{\text{Total number of grafts prepared}} \times 100$$

## RESULTS AND DISCUSSION

*A. Number of days taken to sprout initiation*

The finding presented in the study showed that the application of different treatments had statistically significant effects on days taken to sprout initiation. Among the different treatment BAP 40 ppm + $ZnSO_4$ 500 ppm under the open condition recorded the minimum days for sprout initiation (8.08 days) while maximum days taken with untreated scion (13.05 days) control during September and October. The results indicate that open condition is found better (minimum days 9.76) as compared to shade net condition (maximum days 10.08). The statistical analysis revealed that interaction effect was deemed to be statistically non- significant. However Minimum sprout initiation days (8.00 days) was observed in open condition with treatment of BAP 40 ppm + $ZnSO_4$ 500 ppm while maximum days (13.60 days) to sprout initiation was recorded in control under shade net condition. It might be due to BAP helps in callus formation, which is a prerequisite for a successful graft union formation and Zinc aids carbohydrate in metabolism through sucrose loading and sucrose synthase activity (Brown *et al*., 1993). Hence, less time was required for sprout initiation within combination of BAP and $ZnSO_4$. Similar findings were reported by Rai (2022); Le Khandu (2015).

*B. Sprouting percentage*

The sprouting percentage of grafting as influenced by various treatments and growing conditions showed in Table 2. The maximum sprouting (75.83 % and 77.16 %) percentage was observed with BAP 40 ppm + $ZnSO_4$ 500 ppm treatment while the minimum sprouting (54.16 % and 58.99%) was recorded in the untreated scion shoot of the graft at 30 and 60 days. The growing conditions also showed significant effect on the sprouting percentage. The open condition (66.55% and 69.47%) is found better compared to the shade net condition (63.84% and 66.21%). The statistical analysis revealed that the interaction effect was deemed to be statistically significant. The maximum sprouting (76.66% and 77.66%) was recorded under open condition with treatment BAP 40 ppm + $ZnSO_4$ 500 ppm, while the minimum sprouting (52 % and 57.66%) was recorded in (control) shade net condition at 30 and 60 days.BAP and $ZnSO_4$ in combination help in callus formation. The parenchyma cell comprising the spongy callus tissue penetrates the thin necrotic layers within two to three days and soon fills the space between the two components of the grafts becoming intimately interlocked and providing some mechanical support as well as allowing for limited passage for water and nutrients between the stock and scion and form a successful union (Hartmann *et al.* 2002) due to which minimum days to sprout initiation and maximum sprouting percentage may have taken (Rai (2022; Le Khandu, 2015).

*C. Number of leaves*

The data pertaining to number of leaves may be found in Table 3. These records illustrate the impact of different treatments and growth circumstances on grafted plants. The maximum number of the leaves (8.33 and 12.83) of the grafted plant was recorded with IAA 200 ppm + $ZnSO_4$ 500 ppm dipped scion shoot Conversely, the minimum number of the leaves (5.16) was observed with untreated scion (control). The number of leaves is also influenced by the prevailing growing conditions. The results showed that the

maximum number of the leaves (6.81 and 10.40) was recorded under shade net condition whereas, the minimum number of the leaves 6.29 and 9.77) was noted in open condition. A significant relationship effect was seen between the different treatments and growing condition was found to be non-significant. The results of the study indicate that the maximum number of the leaves (8.66 and 13.66) was noticed in scion dipped with IAA 200 ppm + $ZnSO_4$ 500 ppm in shade net condition while, the minimum number of the leaves (5.00 and 8.00) was observed in untreated scion (control) under open condition. It might be due to the more favourable climatic condition (favourable temperature and cold wave free condition) under the shade net during the low temperature of winter season Kumar (2022).

*D. Survival percentage*

The data analysis showed that different treatments and growing conditions had significant effects on the survival percentage. The maximum survival percentage (74.50 % and 70.17 %) was recorded with IAA 200 ppm + $ZnSO_4$ 500 ppm dipped scion while minimum survival (57.33% and 53.83%) was found with untreated scion (Control) at 90 and 120 days. The growing conditions is also showed a significant effect on the survival percentage. The survival percentage in shade net condition was good (maximum survival 64.81 and 62.44%) compared to open condition (minimum survival 63.66 and 61.48%). The interaction effect of the various treatments and growing conditions was found to be significant. The highest and lowest survival percentages (75.33 to 74.33 % and 58.33 to 53.33 %) with IAA 200 ppm + $ZnSO_4$ 500 ppm and control, under shade net and open conditions at 90 and 120 days respectively. It might be due to that phloem differentiation occurs before xylem differentiation during the formation of the vascular system. As a result, the sieve elements are first diverged from the procambium.

**Table 1: Effect of IAA, BAP, $ZnSO_4$ and growing conditions on days taken to sprout initiation of Mango Grafts.**

| Treatment No. | Scion dip treatments | Growing conditions | | Mean |
|---|---|---|---|---|
| | | Shade Net Condition ($B_1$) | Open Condition ($B_2$) | |
| $T_1$ | Control | 13.60 | 12.50 | 13.05 |
| $T_2$ | IAA 100 ppm + $ZnSO_4$ 250 ppm | 11.04 | 10.78 | 10.91 |
| $T_3$ | IAA 100 ppm + $ZnSO_4$ 500 ppm | 10.91 | 10.87 | 10.89 |
| $T_4$ | IAA 200 ppm + $ZnSO_4$ 250 ppm | 10.27 | 10.15 | 10.21 |
| $T_5$ | IAA 200 ppm + $ZnSO_4$ 500 ppm | 9.98 | 9.90 | 9.94 |
| $T_6$ | BAP 20 ppm + $ZnSO_4$ 250 ppm | 9.40 | 8.87 | 9.14 |
| $T_7$ | BAP 20 ppm + $ZnSO_4$ 500 ppm | 9.00 | 8.45 | 8.73 |
| $T_8$ | BAP 40 ppm + $ZnSO_4$ 250 ppm | 8.38 | 8.30 | 8.34 |
| $T_9$ | BAP 40 ppm + $ZnSO_4$ 500 ppm | 8.15 | 8.00 | 8.08 |
| | Mean | 10.08 | 9.76 | - |
| | | Factor - A | Factor - B | A×B |
| | SE m± | 0.238 | 0.112 | 0.337 |
| | C.D. at 5 % | 0.684 | 0.322 | NS |

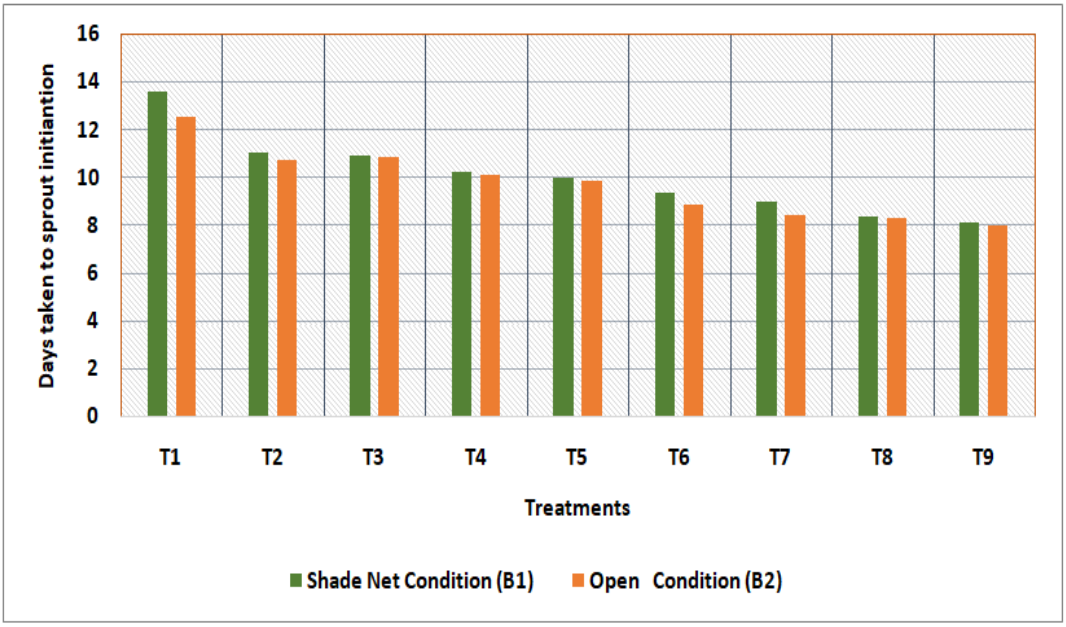


**Fig. 1.** Effect of IAA, BAP, $ZnSO_4$ and growing conditions on days taken to sprout initiation.

The vascular connections between the scion and the rootstocks are made possible by the production of new xylem and phloem. This stage must be finished before several leaf buds on the scion emerge and begin to develop. Otherwise, scion will rapidly get dehydrated and die and this will result in low survival since the increasing leaf surfaces on the scion shoots won't have enough water to make up for what is the lost through transpiration (Hartmann *et al.*, 2002). The growing conditions also significantly influenced survival percentage. The possible reason is somewhat favourable environmental conditions condition i.e., Moderate temperature, frost and cold wave free climate which favours the growth and the metabolic activities of scion shoot in the shade net condition compared to the open condition Kumar (2022).

**Table 2: Effect of IAA, BAP, $ZnSO_4$ and growing conditions on Sprouting percent of Mango Grafts at 30 and 60 days.**

| Scion dip treatments | Sprouting percent at 30 days | | | Sprouting percent at 60 days | | |
|---|---|---|---|---|---|---|
| | Growing conditions | | Mean | Growing conditions | | Mean |
| | Shade Net Condition ($B_1$) | Open Condition ($B_2$) | | Shade Net Condition ($B_1$) | Open Condition ($B_2$) | |
| Control ($T_1$) | 52.00 | 56.33 | 54.16 | 57.66 | 60.33 | 58.99 |
| IAA 100 ppm + $ZnSO_4$ 250 ppm ($T_2$) | 56.00 | 58.33 | 57.16 | 58.66 | 61.33 | 59.99 |
| IAA 100 ppm + $ZnSO_4$ 500 ppm ($T_3$) | 57.33 | 60.00 | 58.66 | 60.00 | 62.00 | 61.00 |
| IAA 200 ppm + $ZnSO_4$ 250 ppm ($T_4$) | 59.66 | 61.33 | 60.49 | 61.66 | 68.00 | 64.83 |
| IAA 200 ppm + $ZnSO_4$ 500 ppm ($T_5$) | 60.00 | 63.33 | 61.66 | 62.33 | 67.00 | 64.66 |
| BAP 20 ppm + $ZnSO_4$ 250 ppm ($T_6$) | 68.66 | 73.66 | 71.16 | 71.00 | 76.66 | 73.83 |
| BAP 20 ppm + $ZnSO_4$ 500 ppm ($T_7$) | 71.33 | 75.33 | 73.3 | 73.33 | 78.33 | 75.83 |
| BAP 40 ppm + $ZnSO_4$ 250 ppm ($T_8$) | 73.66 | 74.00 | 73.83 | 74.66 | 74.00 | 74.33 |
| BAP 40 ppm + $ZnSO_4$ 500 ppm ($T_9$) | 75.00 | 76.66 | 75.83 | 76.66 | 77.66 | 77.16 |
| Mean | 63.84 | 66.55 | - | 66.21 | 69.47 | - |
| | Factor - A | Factor - B | A×B | Factor - A | Factor - B | A×B |
| SE m± | 0.355 | 0.167 | 0.144 | 0.340 | 0.160 | 0.481 |
| C.D. at 5 % | 1.018 | 0.480 | 0.50 | 0.975 | 0.459 | 1.378 |

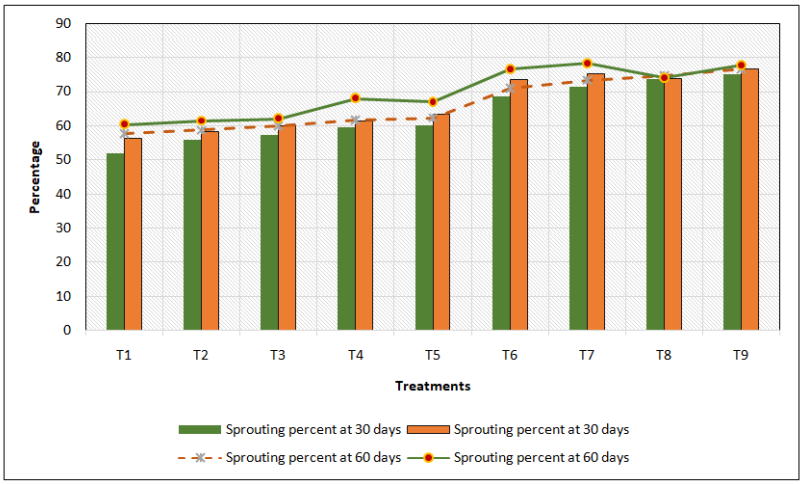


**Fig. 2**. Effect of IAA, BAP, $ZnSO_4$ and growing conditions on Sprouting percent at 30 and 60 days.

**Table 3: Effect of IAA, BAP, $ZnSO_4$ and growing conditions on number of leaves.**

| Scion dip treatments | Number of leaves at 90 days | | | Number of leaves at 120 days | | |
|---|---|---|---|---|---|---|
| | Growing conditions | | Mean | Growing conditions | | Mean |
| | Shade Net Condition ($B_1$) | Open Condition ($B_2$) | | Shade Net Condition ($B_1$) | Open Condition ($B_2$) | |
| Control ($T_1$) | 5.33 | 5.00 | 5.16 | 8.33 | 8.00 | 8.16 |
| IAA 100 ppm + $ZnSO_4$ 250 ppm ($T_2$) | 6.33 | 6.00 | 6.16 | 9.00 | 8.66 | 8.83 |
| IAA 100 ppm + $ZnSO_4$ 500 ppm ($T_3$) | 6.66 | 6.66 | 6.66 | 9.66 | 9.33 | 9.49 |
| IAA 200 ppm + $ZnSO_4$ 250 ppm ($T_4$) | 7.33 | 7.00 | 7.16 | 12.33 | 11.66 | 11.99 |
| IAA 200 ppm + $ZnSO_4$ 500 ppm ($T_5$) | 8.66 | 8.00 | 8.33 | 13.66 | 12.00 | 12.83 |
| BAP 20 ppm + $ZnSO_4$ 250 ppm ($T_6$) | 6.00 | 5.00 | 5.50 | 9.00 | 8.33 | 8.66 |
| BAP 20 ppm + $ZnSO_4$ 500 ppm ($T_7$) | 6.66 | 5.33 | 5.99 | 9.33 | 9.33 | 9.33 |
| BAP 40 ppm + $ZnSO_4$ 250 ppm ($T_8$) | 7.00 | 6.66 | 6.83 | 11.00 | 10.00 | 10.5 |
| BAP 40 ppm + $ZnSO_4$ 500 ppm ($T_9$) | 7.33 | 7.00 | 7.16 | 11.33 | 10.66 | 10.99 |
| Mean | 6.81 | 6.29 | | 10.40 | 9.77 | |
| | Factor - A | Factor - B | A×B | Factor - A | Factor - B | A×B |
| SE m± | 0.327 | 0.154 | 0.463 | 0.502 | 0.237 | 0.710 |
| C.D. at 5 % | 0.938 | 0.442 | NS | 1.439 | 0.678 | NS |


**Fig. 3.** Effect of IAA, BAP, $ZnSO_4$ and growing conditions on No. of leaves at 90 and 120 days

**Table 4: Effect of IAA, BAP, $ZnSO_4$ and growing conditions on Survival percentage of Mango Grafts at 90 and 120 DAG.**

| Scion dip treatments | Survival percentage at 90 days | | | Survival percentage at 120 days | | |
|---|---|---|---|---|---|---|
| | Growing conditions | | Mean | Growing conditions | | Mean |
| | Shade Net Condition ($B_1$) | Open Condition ($B_2$) | | Shade Net Condition ($B_1$) | Open Condition ($B_2$) | |
| Control ($T_1$) | 56.33 | 58.33 | 57.33 | 55.33 | 53.33 | 53.83 |
| IAA 100 ppm + $ZnSO_4$ 250 ppm ($T_2$) | 56.66 | 56.00 | 56.33 | 55.66 | 56.33 | 55.99 |
| IAA 100 ppm + $ZnSO_4$ 500 ppm ($T_3$) | 57.66 | 57.00 | 57.33 | 55.00 | 55.66 | 55.33 |
| IAA 200 ppm + $ZnSO_4$ 250 ppm ($T_4$) | 72.66 | 69.33 | 71.00 | 71.00 | 65.33 | 68.17 |
| IAA 200 ppm + $ZnSO_4$ 500 ppm ($T_5$) | 75.33 | 73.66 | 74.50 | 74.33 | 66.00 | 70.17 |
| BAP 20 ppm + $ZnSO_4$ 250 ppm ($T_6$) | 67.33 | 71.33 | 69.33 | 65.66 | 68.00 | 66.83 |
| BAP 20 ppm + $ZnSO_4$ 500 ppm ($T_7$) | 69.33 | 72.00 | 70.67 | 67.33 | 68.33 | 67.83 |
| BAP 40 ppm + $ZnSO_4$ 250 ppm ($T_8$) | 59.00 | 61.66 | 60.33 | 58.33 | 58.66 | 58.50 |
| BAP 40 ppm + $ZnSO_4$ 500 ppm ($T_9$) | 60.33 | 62.33 | 61.33 | 59.33 | 60.33 | 60.07 |
| Mean | 64.81 | 63.66 | | 62.44 | 61.48 | |
| | Factor - A | Factor - B | A×B | Factor - A | Factor - B | A×B |
| SE m± | 0.270 | 0.127 | 0.382 | 0.311 | 0.147 | 0.440 |
| C.D. at 5 % | 0.776 | 0.366 | 1.097 | 0.893 | 0.421 | 1.263 |

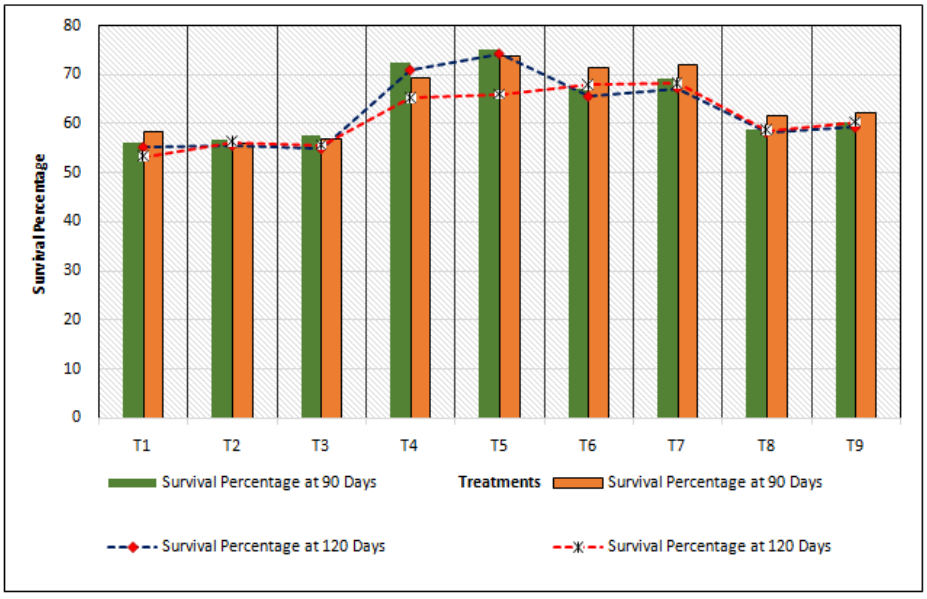


**Fig. 4.** Effect of IAA, BAP, $ZnSO_4$ and growing conditions on Survival percentage at 90 and 120 DAG.

## CONCLUSIONS

On the basis of the research, it is concluded that the BAP 40 ppm + $ZnSO_4$ 500 ppm under open condition was found superior for days taken to sprouting and sprouting percentage. Conversely, the IAA 200 ppm + $ZnSO_4$ 500 ppm under the shade net condition was found superior in terms of maximum number of leaves and survival percentage among all the treatments in wedge grafting during last week of September. The IAA 200 ppm + $ZnSO_4$ 250 ppm under the shade net condition was found next best treatment for maximum number of leaves and survival percentage.

## FUTURE SCOPE

The experiment should be taken up to know the effect of other grafting time and method of propagation with new PGR on the growth, vigour and survival of mango grafts to evaluate and extend the propagation period.

**Acknowledgments.** The authors are highly thankful to the Department of Horticulture, College of Agriculture, Jawaharlal Nehru Krishi Vishwa Vidyalaya (JNKVV), Jabalpur, Madhya Pradesh, India.
**Conflicts of Interest.** None.

## REFERENCES

Anonymous (2021). National Horticulture Board. https://nhb.gov.in/Statistics.

Brown, P. H., Cakmak, I. and Zhang, Q. (1993). Form and Function of Zinc in Plants. In Robson, A. D (Eds). Zinc in soils and plants, Kluwer Academic Publishers, Dordrecht. pp: 90-106.

De Candolle, A. P. (1904) Origin of Cultivated Plants. In: Mango: Botany, Production and Uses, 2nd Edition, CAB International, Wallingford, 5-7

Ghosh, S. N., and Bera, B. (2015). Studies on standardization of propagation methods of some minor fruit crops in India. *International Journal of Minor Fruits, Medicinal and Aromatic Plants, 1*(1), 31–36.

Hartmann, H. T., Kester, D., Davies, F. T. and Geneve, R. L. (2002). Plant Propagation Principles and Practices, 7th Ed. pp: 421-422.

Kumar, B. (2022). Effect of scion dip treatments and timing on growth, vigour and survival of mango grafts under polyhouse. M.Sc. Thesis submitted to JNKVV Jabalpur (M.P.).

Le Khandu (2015). College of Horticulture and Forestry Agricultural University Navsari.

Millington, A. J. (1984). The Mango a review of the world scene. Proceeding of First Australian Mango Research Workshop, Melbourne: CSIRO, Australia, Pp, 14.

Mukherjee, S. K. (1951). The mango its botany, cultivation, uses and future improvement, especially as observed in India. *Economic Botany*, *7*, 130-135.

Mukherjee, S. K. (1967). History, Origin and Botany. In: The Mango A Handbook. Indian Council of Agricultural Research, New Delhi, 1: 13.

Nakasone, H. Y., and Paull, R. E. (1998). Tropical fruits. University of Hawaii, Honolulu, USA: CABI, 132-148.

Panse, V. G. and Sukhatme, P. V. (1985). Statistical Methods for Agricultural Workers. Indian Council of Agricultural Research Publication, 87-89.

Purseglove, J. W. (1972). Tropical Crops, Monocotyledons. Wiley, New York, *2*(83), 91.

Rai, H. S. (2022). Effect of scion dip treatment of IAA, BAP and $ZnSO_4$ on growth, vigour and survival of wedge grafting in Custard apple (*Annona squamosa* L.) M.Sc. Thesis submitted to JNKVV Jabalpur (M.P.).

**How to cite this article:** Lokesh Nagar, C.S. Pandey, Sandeep Raipuriya, S.K. Pandey, Bhavana Mishra and Vishesh Patel (2023). Influence of Scion Dip Treatments and Growing Condition on Success and Survival of Mango (*Mangifera indica* L.) Wedge Graft cv. Dashehari. *Biological Forum – An International Journal, 15*(10): 1068-1073.