



P-ISSN: 2349-8528

E-ISSN: 2321-4902

www.chemijournal.com

IJCS 2020; 8(2): 2235-2237

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Received: 14-01-2020

Accepted: 18-02-2020

Niharika Rathore

Ph.D. Scholar (Department of Horticulture, College of Agriculture, Gwalior), Madhya Pradesh, India

Dr. R Lekhi

Head of the Department (Department of Horticulture, College of Agriculture, Gwalior), Madhya Pradesh, India

Chythra Somanathan Nair

M.Sc. Student (Department of Horticulture, College of Agriculture, Gwalior), Madhya Pradesh, India

DS Mandloi

Program Assistant (Department of Horticulture, College of Agriculture, Gwalior), Madhya Pradesh, India

Poonam Bhadouria

Ph.D. Scholar (Department of Horticulture, College of Agriculture, Gwalior), Madhya Pradesh, India

Dr. Arjun Kashyap

Assistant Professor (Cont.) (Department of Horticulture, College of Agriculture, Gwalior), Madhya Pradesh, India

Corresponding Author:**Niharika Rathore**

Ph.D. Scholar (Department of Horticulture, College of Agriculture, Gwalior), Madhya Pradesh, India

Study of vegetative propagation of guava (*Psidium guajava* L.) Cv. Gwalior-27 throws air layers with different concentration of PBZ.

Niharika Rathore, Dr. R Lekhi, Chythra Somanathan Nair, DS Mandloi, Poonam Bhadouria and Dr. Arjun Kashyap

DOI: <https://doi.org/10.22271/chemi.2020.v8.i2ah.9081>

Abstract

The experiment conducted during 2017-18 at research orchard of Horticulture, College of Agriculture, Gwalior in sandy clay loam soil. Study of Vegetative Propagation of Guava (*Psidium guajava* L.) Cv. Gwalior-27 throws air layers with different concentration of PBZ. The present experiment comprising 3 sources of PBZ Harmon Co, 250ppm, 500ppm were laid out in randomized block design with three replications. experiment Results revealed that maximum root parameter viz., callus formation (0.25mm) rooting percentage(84.44%),no of primary adventitious root (13.26) no of secondary adventitious root (31.21) length of root (3.34) diameters of root (0.44mm),fresh weight of root (1.25g), dry weight of root(0.61g), growth parameter viz., number of leaves(11.92), number of new sprout /layer(4.43), length of shoot(23.78cm), and survival percentage(64.95%), was observed under 500ppm PBZ. Which was significantly higher the other treatment of PBZ. Highest value of all parameters was recorded 500ppm PBZ and the lowest value of recorded under without PBZ Harmon.

Keywords: PBZ, guava, air layers, rooting, vegetative propagation

Introduction

Guava fruit is botanically known as *Psidium guajava* L. it is belongs to Myrtaceae family. Guava is native of Mexico, South America. It has 2n=22 chromosome no this is diploid cultivar. Guava is the most popular fruits grown in tropical and sub-tropical plants. It has been cultivated in India since early 17th century and gradually becomes a crop commercially.

Guava fruit content about four times higher Vit-c, Carbohydrates, Iron, and Fats. Guava fruits are also used for preparation of salad, chutney, jam, jelly, nactor, R.T.S. etc.

Guava is an important fruit crop of India. It stands in area and production after mango, banana and citrus. It occupies an area of 262 Thousand ha. Area and production of 364 MT with productivity 14 MT/Ha in India. Its cultivation is common in India, which is concentrated mainly in Uttar Pradesh, Bihar, Madhya Pradesh, Maharashtra and Chhattisgarh. In Madhya Pradesh it occupies 30.31 Thousand Ha. in area and production 523.75 MT with productivity 17.28 MT/Ha (NHB, 2016-17) [6]. Major guava producing districts in Madhya Pradesh are Jabalpur, Gwalior, Bhopal, Rewa, Neemuch, Ratlam, Khandwa and Mandsaur etc.

The fruit plants are normally propagated by two methods i.e., sexual or by seed and asexual or by vegetative methods. Guava is generally propagated by vegetative methods like, stooling, inarching, air layering, cutting, budding and grafting, Air- layering is an easy meth (Hartmann and Kester, 1972) [4], Air layering with the help of growth substances is more efficacious and is the best method of vegetative propagation of guava as reported by Tingwaand Abbadi (1968) [10] and Mujumdar and Mukherjee (1968) [5]. PBZ combination of 500ppm significantly increase rooting, survival and dry matter percentage. Singh and Bhuj (2000) [9], the growth regulators, PBZ capable for induction of rooting in guava layering. Singh, (1998) [8],

Materials and methods

The present investigation field trial carried on at the research orchard of Department of Horticulture, College of Agriculture, Gwalior during 2017-18. The experiment was laid in Randomized Block Design with three replications with 3 levels of PBZ (C0, 250ppm,

500ppm) used for Guava air layers. For the experiment on nine plants. 50 layers per plants total 450 layers. At the experiment side on the selected branches of pencil size, a ring of bark about 2 cm wide was removed carefully just below the bud without injuring the inner wood. Previously prepared powder containing the growth regulator was applied evenly on all sides of uppercut of the ring with camel hairbrush. For different treatments, different brushes were used. The cut portion was covered with rooting media (soil + FYM) and poly wrappers with the help of jute string.

Result and discussion

The data presenting to different concentration of PBZ in table 1,2 and 3 are relevant that the maximum callus formation (0.25 cm) was recorded in 500ppm PBZ and minimum callus formation (0.21cm in Control) same result are concluded by (Baghel, 1999) and (Mukherjee, 1967)

The maximum rooting percentage (84.44) number of primary (13.26) and secondary (31.20) roots were recorded in 500ppm PBZ and minimum percentage of rooting (66.37) primary (6.44) and secondary (25.36) root were recorded under control (without hormone) the same findings of results was showed by (Singh and Bhuj, 2000) ^[9] and (Te-chato *et al.*, 2009)

The maximum root length (3.34cm) and diameter (0.44mm) were recorded in 500ppm PBZ and minimum was recorded in control and maximum fresh weight of root (1.25 g) and dry (0.61 g) weight were recorded under 500ppm PBZ whereas

minimum fresh (0.69 g) and dry (0.19 g) weight were recorded in control the same conclusion was given by (Patel *et al.* 1989) ^[7] and (Baghel, 1999)

The maximum survival percent (64.95) was recorded in 500ppm PBZ and minimum (57.00) in control (without hormone) whereas length of shoot (23.78 cm) maximally recorded in 500ppm PBZ and minimum (17.27 cm) found in control and maximum number of new sprouts (4.43) with number of leaves (11.92) were noted in 500ppm PBZ whereas minimum found in control the similar result showed by (Singh and Bhuj, 2000) ^[9] and (Singh, 2001)

Conclusion

From the overall assistant of result on the present result work "Study of vegetative propagation of Guava (*Psidium guajava* L.) Cv. Gwalior-27 throws air layers with different concentration of PBZ" 500ppm PBZ was superior in all shoot and root observation as well as survival percent over rest of the treatment finally, it is concluded that 500ppm PBZ was significantly superior in respect shoot and root observations as well as survival of air layer over control (without hormone). This might be due to 500ppm PBZ incurred the accumulation of carbohydrate and auxin which in turn promotes rooting in layerage. Early and established rooting, more root biomass translocation food material to different part of shoot, which ultimately resulted in maximum percent survival of air layers in guava.

Table 1: Effect of different PBZ hormone concentration on callusing, no of primary adventitious roots, no of secondary adventitious roots and success of rooting percentage on air layers of Guava

| Treatment | Callus formation(mm) | Number of primary adventitious roots | Number of secondary adventitious roots | Rooting percentage |
|---------------------------|----------------------|--------------------------------------|--|--------------------|
| Control (without hormone) | 0.21 | 6.44 | 25.36 | 66.37 |
| 250ppm | 0.22 | 11.34 | 28.43 | 81.51 |
| 500ppm | 0.25 | 13.26 | 31.20 | 84.44 |
| S. Em± | 0.01 | 0.11 | 0.43 | 0.33 |
| C.D. at 5% level | 0.03 | 0.33 | 1.28 | 0.99 |

Table 2: Effect of different PBZ hormone concentration on diameter of root, length of roots, fresh weight of roots and dry weight of root on air layers of Guava

| Treatment | Diameter of root (mm) | Length of roots (cm) | Fresh weight of roots(g) | Dry weight of root(g) |
|----------------------|-----------------------|----------------------|--------------------------|-----------------------|
| Co (without hormone) | 0.16 | 1.36 | 0.69 | 0.19 |
| 250ppm | 0.31 | 2.74 | 0.85 | 0.51 |
| 500ppm | 0.44 | 3.34 | 1.25 | 0.61 |
| S. Em± | 0.003 | 0.021 | 0.01 | 0.003 |
| C.D. at 5% level | 0.008 | 0.062 | 0.04 | 0.010 |

Table 3: Effect of different PBZ hormone concentration on survival percent, no of leaves, length of shoot, no of new sprouts on air layers of Guava

| Treatment | survival percent | no of leaves, | length of shoot (cm) | no of new sprouts |
|----------------------|------------------|---------------|----------------------|-------------------|
| Co (without hormone) | 57.00 | 7.82 | 17.27 | 2.82 |
| 250ppm | 62.06 | 9.91 | 21.01 | 3.96 |
| 500ppm | 64.95 | 11.92 | 23.78 | 4.43 |
| S. Em± | 0.06 | 0.08 | 0.07 | 0.06 |
| C.D. at 5% level | 0.18 | 0.25 | 0.21 | 0.18 |

References

- Davis TD, Steffens GL, Sankhla Narendre. Trizole plant growth regulators. Horti. Reviews, 1988; 10:63-69.
- Grossmann K. Plant growth retardants: their mode of action and benefits for physiological res. In progress in plant growth regulation, proceeding of the 14th Intl. Conference on plant growth substances, Amsterdam, 1991ed, 21-26.
- Karssen CM, Van Loon LC, Vreugdenhil D. Kluwer Academic Publishers, London, 788-797.
- Hartmann HT, Kester DE. Plant Propagation: Principles and Practices. Chapman and Hall, London, 1972, 283p.
- Majumdar PK, Mukherjee SK. Guava a new vegetative propagation method. Indian Horticulture. 1968; 12:11-35.
- NHB. National Horticulture Board Database, 2017. WWW.nhb.gov.in

7. Patel RM, Patel RB, Patel MP. Effect of growth regulators and on rooting of air layers of guava. *Bhartiya Krishi Anusandhan Patrika*. 1989; 4(3):145-148
8. Singh DK. Regeneration of guava cultivars by stooling with the aid of PBZ. *Annal Agric. Res.* 1998; 3:317-320.
9. Singh DK, Bhuj BD. Response of air layering of guava to paclobutrazolsnd colour poly wrappers. *Agric. Sci. Digest*. 2000; 20(3):171-173.
10. Tingwa PO, Addadi S. The vegetative propagation of tropical guava (*Psidiumguajava* L.) in the Sudan. *Sudan Agriculture Journal*. 1968; 3:12-20.