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Study of influence the adventitious roots and survivability on air layers of guava (*Psidium guajava* L.) Cv. Gwalior 27 with the add of different coloured poly wrappers

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Abstract

The present investigation conducted field trial during 2017-18 at research orchard of Horticulture, collage of agriculture Gwalior in sandy loam to clay loam soil. The influence of adventitious roots and survivability on air layers of Guava (*Psidium guajava* L) Cv. Gwalior 27 with the add of different coloured poly wrappers. The experiment comprising four sources of poly wrappers (White, Black, Blue and Red) were lead out in randomized block design with 3 replications. The result revealed that maximum value of callus formation (0.25mm), rooting percentage (83.73%), no of primary adventitious roots(11.73), no of secondary adventitious roots (38.58), length of roots (4.17 cm),diameter of roots (0.34mm), fresh weight of roots (1.23 g), dry weight of roots (0.49g), survival percent (64.9%), length of shoot (22.2 inches), no of new sprouts (4.22), no of leaves (11.29) was observed in red coloured poly wrappers. The highest value of all parameters was recorded under red coloured poly wrappers.

Keywords: Guava air layers, poly wrappers, rooting, growth, survivability

Introduction

Guava (*Psidium guajava* L.) is one of the most important and commercial fruit crop of Tropical and subtropical regions of India. It's belonging to be Myrtaceae family. Native of Tropical America. It has $2n=22$ chromosome no is diploid cultivars.

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 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 hectare and production 523.75 MT with productivity 17.28 MT/ha (Anon. NHB, 2016-17).

Guava fruit plants are normally propagated by two methods i.e., sexual or by seed and asexual or by vegetative methods. Multiplication of fruits plants through vegetative method is one of the important aspect of modern fruit culture. Guava can be propagated by grafting, budding and also by layering. Layering is the cheapest, rapid and simple method of guava propagation. (Hartmenn and Kester, 1972) [3] and (Mujumdar and Mukherjee, 1968) [4]., Red and Blue wrappers significantly increased the rooting and survival of guava layers increase in dry matter percentage under red and blue poly wrappers may be due to accumulation of food material in roots of layers. (Singh and Bhuj, 2000) [6], Red and Blue light are most effective for synthesis of biomass (Baghel 1999) [2, 9], black poly wrappers most suitable for increasing the callusing, rooting, survival of air layers (Yadav, 2015) [7], coloured poly wrappers as better to induce maximum rooting and survival of guava layers (Patel *et al.* 1989) [5].

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 the experiment comprising four sources of poly wrappers colors (White, Black, Blue and Red). used for Guava air layers. For the experiment on nine plants were selected. 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 coloured poly wrappers in table 1,2 and 3 are relevant that the maximum callus formation (0.25 cm) was recorded in W₄ and minimum callus formation (0.17 cm) was recorded in white colure poly wrapper same result are concluded by (Baghel, 1999) [2, 9] and (Mukherjee, 1967) [8]

The maximum rooting percentage (83.73) number of primary (11.73) and secondary (30.58) roots were recorded in W₄ (Red) and minimum percentage of rooting (71.07) primary (8.25) and secondary (24.80) root were recorded under W₁ (White) the same findings of results was showed by (Singh and Bhuj, 2000) [6] and (Te-chato *et al.*, 2009) [10]

The maximum length (4.17 cm) and diameter (0.34 mm) were recorded in W₄ (Red) and minimum was recorded in white colour poly wrappers (W₁) and maximum fresh (1.23 g) and dry (.49 g) weight were recorded under W₄ (Red) whereas minimum fresh (0.57 g) and dry (0.40 g) weight were recorded in W₁ (white) the same conclusion was given by (Patel *et al.* 1989) [5] and (Baghel, 1999) [2, 9]

The maximum survival percent (64.97) was recorded in W₄ (red) and minimum (53.98) in W₁ (white) whereas length of

shoot (22.22 cm) maximally recorded in W₄ (red) and minimum (18.33 cm) found in W₁ (white) and maximum number of new sprouts (4.22) with number of leaves (11.29) were noted in W₄ (red) whereas minimum found in W₁ (white) the similar result showed by (Singh and Bhuj, 2000) [6] and (Singh, 2001) [11]

Conclusion

From the overall assistant of result on the present result work Study of influence the adventitious roots and survivability on air layers of Guava (*Psidium guajava* L.) Cv. Gwalior 27 with the add of different coloured poly wrappers. red poly wrapper was superior in all shoot and root observation as well as survival percent over rest of the treatment finally ,it is concluded that red poly wrapper was significantly superior in respect shoot and root observations as well as survival of air layer over white poly wrapper. This might be due to red poly wrapper 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.

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Table 1: Influence of different coloured poly wrappers on callus formation, rooting percentage, no of primary adventitious roots, no of secondary adventitious roots air layers of guava

Treatment	Callus formation (mm)	Rooting percentage	Number of primary adventitious roots	Number of secondary adventitious roots
W ₁ (White)	0.17	71.07	8.25	24.80
W ₂ (Black)	0.19	78.34	10.25	28.27
W ₃ (Blue)	0.21	81.96	11.14	29.67
W ₄ (Red)	0.25	83.73	11.73	30.58
SEm±	0.01	0.39	0.13	0.50
CD at 5% evel	0.03	1.14	0.38	1.48

Table 2: Influence of different coloured poly wrappers on length of roots, diameter of roots, fresh weight of root, dry weight of roots, air layers of guava

Treatment	Length of roots(cm)	Diameter of roots (mm)	Fresh weight of roots (g)	Dry weight of roots (g)
W ₁ (White)	3.35	0.25	0.57	0.40
W ₂ (Black)	3.88	0.30	0.81	0.41
W ₃ (Blue)	4.00	0.33	1.04	0.46
W ₄ (Red)	4.17	0.34	1.23	0.49
SEm±	0.06	0.003	0.01	0.004
CD at 5% level	0.17	0.009	0.04	0.011

Table 3: Influence of different coloured poly wrappers on survival percent, length of shoot, no of new sprouts, no of leaves on air layers of guava

Treatment	Survival percent	Length of shoot (cm)	Number of new sprouts	Number of leaves
W ₁ (White)	53.98	18.33	2.87	8.42
W ₂ (Black)	62.40	20.56	3.76	9.51
W ₃ (Blue)	64.01	21.65	4.08	10.33
W ₄ (Red)	64.97	22.22	4.22	11.29
SEm±	0.07	0.08	0.72	0.09
CD at 5% level	0.21	0.24	0.21	0.28

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