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Impact of season, growing condition and growth parameter of softwood grafting in Jamun (*Syzygium cumini* Skeel)

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Abstract

An investigation was carried out to Impact of season, growing condition and growth parameter of softwood grafting in Jamun under low cost polyhouse, shade net and open field conditions during 2016-17 at monthly interval of April to August 2016. The experiment was laid out with three replications comprising of fifteen treatments. The data were statistically analysed by split plot design. The result relevant that maximum number of sprouts T₇ (M₃C₁: June + low cost polyhouse) (3.30), maximum number of branches per graft as observed T₇ (M₃C₁: June + low cost polyhouse) (4.69), height number of leaves T₈ (M₃C₂: June + shade net) (12.39) and highest graft height observed T₇ (M₃C₁: June + low cost polyhouse) (23.84 cm) maximum results are obtained under treatment of T₇ (M₃C₁: June + low cost polyhouse).

Keywords: Number of leaves, Graft height, Jamun, conditions, Seasons, Softwood grafting

Introduction

Jamun (*Syzygium cumini* Skeels.) is one of the minor fruit crops having nutritional and high therapeutic value. It is also known as Indian Black berry, Black plum and Java plum. It belongs to the family Myrtaceae, under the order Myrtales. The original home of jamun is India or the East Indies (Singh and Srivastava, 2000). In recent years, it has attained importance as an arid zone horticulture crop because of its hardy nature, high yielding potential besides its nutritious fruits. Fruit possesses considerable nutritive value. It is a good source of iron, apart from the usual content like minerals, sugar, proteins, pigments, etc. (Singh and Srivastava, 2000). The seed powder has antidiabetic properties and cures ringworm (Dastur, 1952). Plant propagation is an important part of jamun improvement. However, at present the majority of nursery owners utilize sexual method of propagation for the multiplication. As this crop has gained importance due to its medicinal and nutritive value, the orchardists are demanding genuine true-to-type planting materials in order to optimize production of quality fruits, an early bearing and dwarf tree type with high yield potential. But poor germination, slow growth of rootstock seedlings, lack of information on season and suitable method of propagation have rendered the clonal multiplication process more difficult to produce large scale planting material. Softwood grafting has gained popularity as it is very simple and easier to adopt especially in arid regions. Grafting is determined by various factors such as grafting seasons, grafting methods, etc. Based on the studies, grafts performed during different seasons i. e. custard apple in August (Joshi *et al.*, 2000), mango in August (Prasanth *et al.*, 2007), aonla in January (Panchbhai *et al.*, 2006; Roshan *et al.*, 2013) and sapota in July (Ghosh *et al.*, 2010) gave maximum graft success. With respect to propagation of different season indicated that graft performed in low cost polyhouse gave maximum number of sprouts, numbers of branches, number of leaves, graft height, numbers of branches, than shade net and open condition [Hema Nair *et al.* (2002) in mango, Visen *et al.* (2010) in guava, Selvi *et al.* (2008) in Jack fruit, Shinde *et al.* (2010) in jamun and Sivudu *et al.* (2014) in mango]. Therefore, there is a need for standardization of seasons as well as propagation different condition for softwood grafting in jamun to obtain the highest number of leaves and graft height and hence formed the basis for this study under Bangalore condition. To the site of grafting. Softwood grafting was performed on the same day of separation. Then the scions were covered with small polythene bags to avoid desiccation of the scion by creating humidity near and above the graft union. The data were analyzed as per method suggested by Panse and Sukhatme (1985).

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Materials and Methods

The experiment was carried out at Department of Horticulture, GKVK, University of Agricultural Sciences, Bangalore, during 2016-17 to Impact of season, growing condition and growth parameter of softwood grafting in Jamun under low cost polyhouse, shade net and open condition at monthly intervals from April to August 2016. Experiment was laid out in Split plot design with 15 treatments and three replications. Sixty plants were used per treatment. Pre-raised jamun seedlings of 8-10 months old having pencil size thickness, vigorous growth and uniform size were selected as rootstock for grafting. For the bud-sticks collection, the past season growths were defoliated seven days prior to the grafting operation to make the buds activated. The tree scion shoots were monthly collected from mother trees in the morning time on the day of grafting. Immediately after separation of the scions from the mother tree, they were wrapped in moist cloth and carried in polythene covers to the site of grafting. Softwood grafting was performed on the same day of separation. Then the scions were covered with small polythene bags to avoid desiccation of the scion by creating humidity near and above the graft union. The observation on number of leaves, number of sprouts, and numbers of branches, recorded at 30 days after grafting and graft Height recorded at 60 days of grafting. The data were analyzed as per method suggested by Panse and Sukhatme (1985).

Results and Discussion

Table 1: Effect of season and different growing condition of softwood grafting on number of sprouts and number of branches in jamun (*Syzygium cumini* Skeel)

Treatments	Number of sprouts	Number of branches
Months (M)		
M ₁ -April	1.94	3.54
M ₂ -May	2.60	3.55
M ₃ -June	2.72	4.46
M ₄ -July	2.59	4.34
M ₅ -August	2.55	2.50
S.Em±	0.12	0.15
C.D at 5%	0.38	0.48
Condition(C)		
C ₁ -Low cost polyhouse	2.78	4.17
C ₂ -Shade net	2.04	3.58
C ₃ -Open field	2.62	3.28
S.Em±	0.08	0.08
C.D at 5%	0.25	0.24
Interaction (M × C)		
M ₁ C ₁	1.90	3.94
M ₁ C ₂	2.04	3.83
M ₁ C ₃	1.89	2.83
M ₂ C ₁	3.20	4.09
M ₂ C ₂	1.75	3.47
M ₂ C ₃	2.85	3.10
M ₃ C ₁	3.30	4.69
M ₃ C ₂	2.29	4.41
M ₃ C ₃	2.57	4.28
M ₄ C ₁	2.53	4.66
M ₄ C ₂	2.19	4.06
M ₄ C ₃	3.04	4.30
M ₅ C ₁	2.97	3.46
M ₅ C ₂	1.94	2.13
M ₅ C ₃	2.74	1.90
F test (p≤0.05)	*	*
S.Em±	0.19	0.19
C.D at 5%	0.57	0.56

* - significant

T₁- M₁C₁: April + Low cost polyhouse

The data in respect of maximum number of sprouts (2.72, 2.78) under the month of June (M₃), low cost polyhouse (C₁) respectively (Table 1). This could be due to better healing of the graft union. favourable temperature and relative humidity induces sprouts and also good sap flow in the grafts. Similar findings were reported by Ghojage *et al.* (2011) in jamun, Pawar *et al.* (2003) and Kudmulwar *et al.* (2008) in custard apple.

The height number of branches (4.46, 4.17) under the month of June (M₃), low cost polyhouse (C₁) respectively (Table-1). This could be due due to favorable climatic condition like high relative humidity and increase in translocation of food material. Similar results were reported by Mohammad and Mohammad, (2005).

The height number of leaves (11.45, 11.64) was found under the June (M₃), shade net (C₂) respectively (Table-2). Could also be correlated to higher cell activity and active growth of both stock and scion in the prevailing favourable climatic condition. Pawar *et al.* (2003) in custard apple and Ghojage *et al.* (2011) in jamun recorded the same results.

Maximum graft height (19.73, 19.78) was found in June month (M₃), low cost polyhouse (C₁) respectively (Table-2). This Might be due to higher cell activity and early healing of graft union which resulted in more sprouting and faster growth of grafts. Islam and Rahim (2010) in mango and Gadekar *et al.* (2010) in jamun reported the same results.

T₂- M₁C₂: April + Shade net
 T₃- M₁C₃: April + Open field
 T₄- M₂C₁: May + Low cost polyhouse
 T₅- M₂C₂: May + Shade net
 T₆- M₂C₃: May + Open field
 T₇- M₃C₁: June + Low cost polyhouse
 T₈- M₃C₂: June + Shade net
 T₉- M₃C₃: June + Open field
 T₁₀- M₄C₁: July + Low cost polyhouse
 T₁₁- M₄C₂: July + Shade net
 T₁₂- M₄C₃: July + Open field
 T₁₃- M₅C₁: August + Low cost polyhouse
 T₁₄- M₅C₂: August + Shade net
 T₁₅- M₅C₃: August + Open field

Table 2: Effect of season and different growing condition of softwood grafting on number of leaves and graft height in jamun (*Syzygium cumini* Skeel)

Treatments	Number of Leaves	Graft height
Months (M)		
M ₁ -April	7.46	14.65
M ₂ -May	9.72	18.09
M ₃ -June	11.45	19.73
M ₄ -July	8.49	17.47
M ₅ -August	8.17	16.37
S.Em±	0.16	0.62
C.D at 5%	0.54	2.04
Condition(C)		
C ₁ -Low cost polyhouse	09.17	19.78
C ₂ -Shade net	11.64	15.71
C ₃ -Open field	06.35	16.29
S.Em±	00.16	0.64
C.D at 5%	00.48	1.90
Interaction (M × C)		
M ₁ C ₁	06.81	16.21
M ₁ C ₂	10.52	14.39
M ₁ C ₃	05.04	13.34
M ₂ C ₁	10.31	19.32
M ₂ C ₂	12.65	18.31
M ₂ C ₃	06.20	16.63
M ₃ C ₁	12.23	23.84
M ₃ C ₂	12.39	19.33
M ₃ C ₃	09.74	16.00
M ₄ C ₁	07.50	18.87
M ₄ C ₂	11.61	15.53
M ₄ C ₃	06.37	18.00
M ₅ C ₁	09.03	20.67
M ₅ C ₂	11.05	10.96
M ₅ C ₃	04.43	17.49
F test (p≤0.05)	*	*
S.Em±	00.37	1.45
C.D at 5%	01.08	4.27

*; significant

T₁- M₁C₁: April + Low cost polyhouse
 T₂- M₁C₂: April + Shade net
 T₃- M₁C₃: April + Open field
 T₄- M₂C₁: May + Low cost polyhouse
 T₅- M₂C₂: May + Shade net
 T₆- M₂C₃: May + Open field
 T₇- M₃C₁: June + Low cost polyhouse
 T₈- M₃C₂: June + Shade net
 T₉- M₃C₃: June + Open field
 T₁₀- M₄C₁: July + Low cost polyhouse
 T₁₁- M₄C₂: July + Shade net
 T₁₂- M₄C₃: July + Open field
 T₁₃- M₅C₁: August + Low cost polyhouse
 T₁₄- M₅C₂: August + Shade net
 T₁₅- M₅C₃: August + Open field

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