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EFFECT OF COLORED SHADE NETS ON SOFTWOOD GRAFTING SUCCESS IN JAMUN (*SYZIGIUM CUMINII* SKEELS)

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Abstract

An investigation on effect of coloured shade nets on softwood grafting success in jamun was undertaken at Kittur Rani Channamma College of Horticulture, Arabhavi, U.H.S., Bagalkot (Karnataka), India; during 2010-12. The influence of different coloured shade nets *viz.*, white, red, black, green and blue on graft take after 3 months after grafting was significant. The grafts kept under red colored shade nets recorded highest graft success (72.50%). Significantly least graft success was recorded in grafts under the blue shade net (47.50%). No significant difference was found for graft survival at four months after grafting under different colored shade nets. The survival percentage recorded under different colored shade nets varied from 92.71 per cent (white) to 96.87 per cent (red). There was no significant difference for graft height under different colored shade nets during the period of investigation. There was no significant difference for number of sprouts of grafts under different colored shade nets. At 30 DAG and 60 DAG, significantly higher number of leaves per graft was recorded in grafts kept under white shade net (5.6 and 8.96, respectively). At 90 DAG, significantly maximum number of leaves was recorded in grafts under red shade net (12.00). Minimum number of leaves was recorded in grafts under blue shade net (8.22). Thus, colored shade nets showed significant influence on graft take and graft growth parameters.

Key words : Jamun, coloured shade nets, softwood grafting, graft take, graft growth.

Introduction

The jamun (*Syzigium cuminii* Skeels), a member of family myrtaceae is one of the important underutilized fruits widely distributed throughout the tropics and subtropics. It is native to India or East Indies. In India, the maximum number of jamun trees is found scattered throughout the tropical and subtropical regions. It has gained tremendous importance and recognition in recent past not only because of its hardy nature, but also for its incomparable medicinal and nutritional properties. Jamun has been attributed in the Indian folklore medicine system to possess several medicinal properties (Warrier *et al*., 1996). The fruits are good source of iron, minerals, sugars and proteins. Besides its use as dessert fruit, jamun is used for preparation of delicious beverages, jellies, jam, squash, wine, vinegar etc. (Thaper, 1958).

Information regarding the area and production of jamun in India is not available because it is seldom plant in the orchards of perennial fruit crops and generally scattered trees are found in fruit plantations. However, jamun is distributed naturally throughout the tropical and subtropical regions of India. In recent years, organized orchards are being established in different jamun growing areas. Softwood grafting had proved to be a suitable method of propagation in jamun as it maintains the uniformity among planting materials (Ghojage *et al*., 2011b). Light quality (red: far-red ratio) can affect plant growth and can be used to manipulate stock plant management, seed germination and shoot development. Coloured netting is not used on a routine basis in agroforestry tree nurseries, but an easy way to change the light quality favourably for vegetative growth, for example in stock plant management. Use of colored shade nets or polyhouses for production of fruit crops is being practised as a new technology to know their effects on growth of plants. Hence, an attempt was made to know the effect of colored shade nets on jamun softwood grafts.

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Materials and Methods

The study was undertaken at K. R. C. College of Horticulture, Arabhavi, U.H.S., Bagalkot (Karnataka), India; during 2010-12. The experiment was designed in CRD with five treatments and four replications. The treatments included different coloured shade nets *viz.*, white, black, red, blue and green. Uniform sized healthy, disease and pest free vigorously grown ten month rootstocks were selected and used for softwood grafting. Scions were collected from a selected genotype located at the mother nursery. Softwood grafting was done on ten months old rootstocks and grafts were kept inside the different shade nets. The observations on per cent graft success (at 90 days after grafting), per cent survivability (at 120 days after grafting) and growth parameters like height of graft, number of sprouts and number of leaves (at monthly intervals) were recorded.

Results and Discussion

In the present investigation, results revealed that coloured shade nets have varying effects on success and growth jamun softwood grafts. The effects are evident from differences in the graft take and growth parameters of the grafts (tables 1 and 2). The influence of different coloured shade nets on graft success was found significant while graft survivability was found non-significant. The grafts kept under red coloured shade nets recorded highest graft success (72.50%), which was on par with grafts under white shade net (70.00%) and black shade net (65.00%). Significantly least graft success of 47.50 per cent was recorded in grafts under the blue shade net. There was no significant difference for graft survival at four months after grafting under different coloured shade nets. The survival percentage recorded under different coloured shade nets varied from 92.71 per cent (white) to 96.87 per cent in red shade net (table 1).

Table 1 : Effect of coloured shade nets on softwood grafting success and graft survivability.

Treatments	Per cent success (90 DAG)	Per cent survival (120 DAG)
T_1 (White)	70.00 (56.94)*	92.71 (78.47)
T_2 (Black)	65.00 (53.77)	96.43 (83.96)
T_3 (Red)	72.50 (58.43)	96.88 (84.33)
T_4 (Blue)	47.50 (43.55)	95.83 (83.48)
T_5 (Green)	57.50 (49.38)	95.75 (82.87)
S. Em ±	2.36	5.83
CD (5%)	7.13	17.59
CD at 1%	9.86	24.33

DAG – Days after grafting
*Values in parenthesis are angular transformation data.

The results on vegetative growth parameters *viz.*, graft height and number sprouts were found non-significant while there was significant difference for number of leaves produced per graft (table 2). Comparatively higher graft height was recorded in grafts kept under white shade net and green shade net at 30 and 60 days after grafting. There was not much variation for graft height among the five treatments. Comparatively higher number of sprouts was recorded in grafts kept under white and red shade net at 30, 60 and 90 days after grafting. At 30 DAG, significantly higher number of leaves per graft was recorded in grafts kept under white shade net (5.6), which was statistically on par with red shade net (4.05) and green shade net (3.70). The minimum number of leaves was recorded in grafts under blue shade net (2.75). At 60 DAG, significantly higher number of leaves per graft was recorded in grafts kept under white shade net (8.96), which was on par with black shade net (7.94), green (7.87) and red (7.81) shade nets (table 2). Significantly lower number of leaves was produced in grafts under blue shade net (5.08). At 90 DAG, significantly maximum number of leaves was

Table 2: Effect of coloured shade nets on growth of grafts

Treatments	Graft height (cm)			Number of sprouts			Number of leaves		
	30 DAG	60 DAG	90 DAG	30 DAG	60 DAG	90 DAG	30 DAG	60 DAG	90 DAG
T_1 (White)	34.55	36.11	37.76	2.30	1.80	2.05	5.60	8.96	11.43
T_2 (Black)	31.97	34.19	36.86	1.35	1.37	1.58	3.50	7.94	10.34
T_3 (Red)	31.70	35.26	37.53	1.70	2.25	2.31	4.05	7.81	12.00
T_4 (Blue)	31.17	33.62	35.60	1.45	1.54	1.75	2.75	5.08	8.23
T_5 (Green)	31.80	33.99	36.17	1.55	1.81	1.91	3.70	7.87	10.93
S.Em±	-	-	-	-	-	-	0.47	0.63	0.62
CD at 5%	NS	NS	NS	NS	NS	NS	1.43	1.89	1.88
CD at 1%	NS	NS	NS	NS	NS	NS	1.98	2.62	2.59

DAG – Days after grafting.

recorded in grafts under red shade net (12.00) which was on par with white (11.42), green (10.92) and black shade net (10.34). Minimum number of leaves (8.22) was recorded in grafts kept under blue shade net (table 2).

The higher success rate of grafts kept under red, white and black shade nets may be due to higher number of sprouts and leaves. This may be influenced by various factors like variation in the light quality, increased photosynthesis, moderate temperature and relative humidity (Hasanein *et al.*, 2011).

Hasanein *et al.* (2011) reported that vegetative growth was increased with black shading than without shading in strawberry. Yield and its components were increased under black shading than the control. The lowest vegetative growth, fruit and yield characters were obtained from the control (without shading). In the present study, there was not much variation in microclimatic parameters among the different coloured shade nets. The coloured shade nets exert only minor interference on the plant micro-climate, but nevertheless are able to modify both the quantity and the quality of the transmitted sunlight. Shamir *et al*. (2001) reported that blue nets do not transmit light between 580 and 750 nm, thus keeping the R/FR ratio similar to that of natural sunlight. Thus, the lack of FR (700-750 nm) may be a major inducer of dwarfing and other inhibition effects in blue nets. The major effects of the coloured liquid filters were attributed to the relative absorption of red (elongation) or far-red light (Rajapakse *et al*., 1999). It was suggested that these effects were mediated by gibberellins, as the conversion of inactive GA to the active form is inhibited by red, but promoted by far-red light, and is controlled by phytochromes (Rajapakse *et al.,* 1999 and Hedden and Kamiya, 1997).

The results of the study reveal that growth parameters of the grafts can be manipulated by use of different coloured shade nets. Unravelling the physiological response to the red net awaits further studies.

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