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## Studies on grafting success of chilli (*Capsicum annuum* L.) on different rootstocks

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### Abstract

The experiment entitled “Studies on the grafting success of chilli (*Capsicum annuum* L.) on different rootstocks” was carried out at Hi-tech Unit, College of Horticulture, Dapoli, Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli, Dist – Ratnagiri (M.S.) during year 2020-21 and 2021-22 with nine treatment combinations and four replications under Factorial Randomized Block Design (FRBD). The factor 1 was Rootstocks: R<sub>1</sub> – *Capsicum frutescens*, R<sub>2</sub> – Pusa Jwala and R<sub>3</sub> – Konkan Kirti. Factor 2 was Scions (F<sub>1</sub> hybrids): S<sub>1</sub> – NCH-1901, S<sub>2</sub> – Sitara and S<sub>3</sub> – Jalsa. The grafting was done using splice method with the help of silicon grafting clips of size 1.5 mm and 1.7 mm. The girth of rootstock at collar during grafting showed the significant effect and the maximum girth was registered in rootstock R<sub>3</sub> (2.03 mm) while minimum was recorded in rootstock R<sub>2</sub> (1.82 mm). The girth of scion at collar during grafting also registered the significant effect with the maximum girth in scion S<sub>1</sub> (1.81 mm) whereas minimum in scion S<sub>2</sub> (1.74 mm). The effect of rootstock on the graft survival at 21 DAG was found significant and highest graft survival was recorded in R<sub>1</sub> (83.09%) whereas it was lowest in R<sub>3</sub> (81.50%). The effect of scion and interaction effect on graft survival were non-significant. The rootstock, scion and interaction effect on tap root length was significant and recorded maximum tap root length in R<sub>2</sub> (20.65 cm) and minimum in R<sub>3</sub> (15.41 cm) whereas effect of scion on root length was maximum in S<sub>1</sub> (19.45 cm) and minimum in S<sub>2</sub> (16.31 cm). The maximum tap root length in interaction effect was recorded in R<sub>2</sub>S<sub>1</sub> (22.65 cm) and minimum in R<sub>3</sub>S<sub>3</sub> (13.55 cm). The effect of rootstock and scion on number of adventitious roots was significant and recorded highest number of adventitious roots in R<sub>3</sub> (27.92) and was lowest in R<sub>1</sub> (22.61). In scion, the highest number of adventitious roots was recorded in S<sub>1</sub> (27.69) and lowest in S<sub>2</sub> (24.12). The interaction effect on number of adventitious roots was also significant and recorded highest in combination R<sub>2</sub>S<sub>1</sub> (31.23) and was lowest in R<sub>1</sub>S<sub>3</sub> (22.23).

**Keywords:** Chilli, grafting, rootstocks, scions, girth, grafting success, grafting survival

### Introduction

Grafting in vegetables is an emerging horticultural technology specially to cope up the effect of various biotic stresses in different commercially grown vegetable crops. Vegetable grafting on compatible resistant/tolerant rootstocks help to resist the soil borne diseases, nematodes as well as to increase the yield. Chilli (*Capsicum annuum* L.) is the most important and widely cultivated vegetable and spice crop. In order to prevent soil-borne diseases in continuous cropping, commercially grown chilli cultivars can be grafted on different rootstocks which are resistant to various biotic and abiotic stresses. Among biotic stresses, bacterial wilt caused by *Ralstonia solanacearum* is one of the most devastating diseases of the solanaceous vegetables causing severe yield losses. The present ratio of grafting in peppers is 5-10% (Lee *et al.*, 2010) [3] and the use of grafted chillies is expected to increase in future. The use of vegetable grafts will be most successful when complemented with sustainable farming system practices (Kubota and McClure, 2008) [2]. Cultivation of vegetable grafts permits not only pest resistance and high yields but also ameliorates crop losses caused by adverse environmental conditions and helps to reduce use of chemicals especially towards disease control. Grafting imparts resistance to pathogenic agents and soil pests, tolerance to abiotic stress factors, improves water and nutrient absorption and increases the graft vigour (King *et al.*, 2010 [1]; Lee, 1994) [10]. In India, grafting in chilli is still in infancy due to lack of knowledge, awareness and non-identification of resistant rootstocks. Since grafting gives increased disease tolerance and vigour to crops so it will be useful in the low input sustainable horticulture of the future. In Konkan region of Maharashtra, bacterial wilt is major bottleneck in commercial cultivation of solanaceous crops as most of the soils are wilt sick. Hence, an experiment was carried out with the aim of determining the grafting success of chilli on different rootstocks.

## Material and Methods

The present investigation entitled “Studies on grafting success of chilli (*Capsicum annum L.*) on different rootstocks” was carried out at Hi-tech Unit, College of Horticulture, Dapoli, Dr. Balasaheb Sawant Konkan Krishi Vidyaapeeth, Dapoli, Dist – Ratnagiri (M.S.) during year 2020-21 and 2021-22. The experiment was laid out in Factorial Randomized Block Design (FRBD) with nine treatment combinations and four replications. The factor 1 was Rootstocks: R<sub>1</sub> – *Capsicum frutescens*, R<sub>2</sub> – Pusa Jwala and R<sub>3</sub> – Konkan Kirti whereas Factor 2 was Scions (F<sub>1</sub> hybrids): S<sub>1</sub> – NCH-1901, S<sub>2</sub> – Sitara and S<sub>3</sub> – Jalsa. The sowing of rootstock and scion seeds was done in portrays (104 celled) with sterilized media of cocopeat and vermicompost in 3:1 proportion. Rootstock seeds were sown one week earlier than scion seeds. Grafting was done by splice method by using the silicon clips of size 1.5 and 1.7 mm after attaining the stage of grafting. The prepared grafts were immediately placed in the healing chamber having relative humidity 90-95% to maintain turgidity to ensure high grafting success. After 5-6 days, the humidity was gradually decreased by increasing the light intensity and temperature by gently exposing them to the open conditions. After healing of union, the grafts were transferred in shade net conditions where they were gradually exposed to the open conditions for necessary hardening before transplanting (Plate 1). The various observations viz., girth of rootstock and scion at collar during grafting (mm), grafting success (%) at 3, 6, 9, 12 and 15 days after grafting, grafting survival (%) at 21 DAG, girth of rootstock at transplanting (mm), tap root length (cm) and number of adventitious roots were recorded. The data obtained were analysed as per the method suggested by Panse and Sukhatme (1995) [7].

## Results and Discussions

The results presented in table 1 indicated that the highest girth of rootstock at collar during grafting was recorded in R<sub>3</sub> (2.03 mm) whereas it was lowest R<sub>2</sub> (1.82 mm). The data regarding the girth of scion at collar during grafting are presented in table 1 which indicated the significant effect among the various scions. The maximum girth was registered in scion S<sub>1</sub> (1.81 mm) which was at par with S<sub>3</sub> (1.79 mm) whereas minimum in scion S<sub>2</sub> (1.74 mm). The girth of scions registered in present investigation was found suitable for grafting. Palada and Wu (2009) [6] reported that in sweet peppers scion and rootstock seedlings required 1.6-1.8 mm stem diameter for grafting.

The data presented in table 2, 3, 4, 5 and 6 exhibited non-significant effect of rootstock, scion and interaction on grafting success at 3<sup>rd</sup>, 6<sup>th</sup>, 9<sup>th</sup>, 12<sup>th</sup> and 15<sup>th</sup> DAG. However, the rootstock effect on the grafting survival at 21 DAG (Table

7) was found significant and highest grafting survival was recorded in R<sub>1</sub> (83.09%) whereas it was lowest R<sub>3</sub> (81.50%). The scion and interaction effects on grafting survival were non-significant. It might be due to favourable conditions provided in the healing chamber i.e, relative humidity above 90 to 95% and a temperature in range of 21 to 30°C. Nkansanh *et al.* (2013) [5] observed that the ‘Tropimech’ tomato cultivar grafted on green eggplant cultivar recorded 96.07% graft success. Uttekar *et al.* (2022) [9] reported the highest survival rate at 21 DAG (75.50%) when shade net structure was used as healing chamber and minimum (30.25%) in polycarbonated polyhouse used for healing of the grafts in chilli. The success of grafting of King chilli scion on Mem and Moni Jolokia rootstocks in the investigation by Rinku Phukon *et al.*, (2020) [8] was 80% and 75% respectively.

The rootstock, scion and interaction effects on the girth of rootstock at the time of transplanting was found significant (Table 8). In rootstock effect, maximum girth of rootstock was recorded in R<sub>3</sub> (2.31 mm) which was at par with R<sub>1</sub> (2.28 mm) whereas it was minimum in R<sub>2</sub> (2.23 mm). In scion effect, the maximum girth was recorded in S<sub>3</sub> (2.39 mm) and minimum in S<sub>2</sub> (2.20 mm). In interaction effect, the combination R<sub>3</sub>S<sub>3</sub> (2.45 mm) recorded maximum girth which was at par with R<sub>1</sub>S<sub>2</sub> (2.42 mm). Minimum girth was recorded in R<sub>2</sub>S<sub>2</sub> (2.01 mm). The significant variation in girth of rootstock might be due to uptake of more nutrients by the rootstock and also might be due to scion stock relationship. Uttekar *et al.*, 2022 [9] reported the girth below the graft union in range of 2.11 mm to 2.59 mm at 21 days after grafting in chilli.

The data presented in table 9 depicted that the effect rootstock, scion and interaction effect on tap root length was significant. For rootstock effect, R<sub>2</sub> (20.65 cm) recorded maximum tap root length and the minimum was recorded in R<sub>3</sub> (15.41 cm). In scion effect, maximum tap root length was observed in S<sub>1</sub> (19.45 cm) and the minimum was recorded in S<sub>2</sub> (16.31 cm). The maximum tap root length in interaction effect was recorded in R<sub>2</sub>S<sub>1</sub> (22.65 cm) and it was minimum in R<sub>3</sub>S<sub>3</sub> (13.55 cm).

The rootstock effect on number of adventitious roots (Table 10) was significant and recorded highest number of adventitious roots in R<sub>3</sub> (27.92) and was lowest in R<sub>1</sub> (22.61). The scion effect on number of adventitious roots was also significant and recorded highest number in S<sub>1</sub> (27.69) and lowest in S<sub>2</sub> (24.12). The interaction effect on number of adventitious roots was also significant and recorded highest number of adventitious roots in combination R<sub>2</sub>S<sub>1</sub> (31.23) and was lowest in R<sub>1</sub>S<sub>3</sub> (22.23).

**Table 1:** Girth of rootstocks (R) and scions (S) (mm) at collar during grafting in chilli

Treatment	Girth of rootstock at collar during grafting (mm)			Treatment	Girth of scion at collar during grafting (mm)		
	20-21	21-22	Pooled		20-21	21-22	Pooled
R <sub>1</sub>	1.90	1.93	1.91	S <sub>1</sub>	1.80	1.82	1.81
R <sub>2</sub>	1.78	1.85	1.82	S <sub>2</sub>	1.76	1.72	1.74
R <sub>3</sub>	2.02	2.05	2.03	S <sub>3</sub>	1.79	1.79	1.79
F test	SIG	SIG	SIG	F test	SIG	SIG	SIG
S.Em ±	0.04	0.03	0.03	S.Em ±	0.01	0.02	0.01
C.D.@ 5%	0.12	0.09	0.09	C.D.@ 5%	0.03	0.06	0.04

R<sub>1</sub> – *Capsicum frutescens*, R<sub>2</sub> – Pusa Jwala, R<sub>3</sub> – Konkan Kirti  
S<sub>1</sub> – NCH-1901, S<sub>2</sub> – Sitara, S<sub>3</sub> – Jalsa

**Table 2: Grafting success (%) at 3<sup>rd</sup> day after grafting in chilli**

Treatment	20-21				21-22				Pooled			
	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	Mean	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	Mean	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	Mean
R <sub>1</sub>	99.26 (86.57)	99.26 (86.57)	99.26 (86.57)	99.26 (86.57)	100.00 (90.00)	100.00 (90.00)	98.77 (84.56)	99.59 (88.19)	99.63 (88.28)	99.63 (88.28)	99.02 (85.56)	99.43 (87.38)
R <sub>2</sub>	99.51 (87.99)	99.26 (86.57)	99.26 (86.57)	99.35 (87.04)	98.53 (85.13)	100.00 (90.00)	100.00 (90.00)	99.51 (88.38)	99.02 (86.56)	99.63 (88.28)	99.63 (88.28)	99.43 (87.71)
R <sub>3</sub>	99.02 (85.98)	99.51 (87.99)	99.26 (86.57)	99.26 (86.84)	98.28 (83.71)	100.00 (90.00)	100.00 (90.00)	99.43 (87.90)	98.65 (84.84)	99.75 (88.99)	99.63 (88.28)	99.35 (87.37)
Mean	99.26 (86.84)	99.35 (87.04)	99.26 (86.57)		98.94 (86.28)	100.00 (90.00)	99.59 (88.19)		99.10 (86.56)	99.67 (88.52)	99.43 (87.38)	
	R	S	R X S		R	S	R X S		R	S	R X S	
F test	NS	NS	NS		NS	SIG	SIG		NS	NS	NS	
S.Em±	1.13	1.13	1.96		0.78	0.78	1.36		0.69	0.69	1.19	
CD at 5%	-	-	-		-	2.30	3.98		-	-	-	

(Figures in the parenthesis indicate arcsine transformed value)

R<sub>1</sub> – *Capsicum frutescens*, R<sub>2</sub> – Pusa Jwala, R<sub>3</sub> – Konkan Kirti

S<sub>1</sub> – NCH-1901, S<sub>2</sub> – Sitara, S<sub>3</sub> – Jalsa

**Table 3: Grafting success (%) at 6<sup>th</sup> day after grafting in chilli**

Treatment	20-21				21-22				Pooled			
	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	Mean	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	Mean	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	Mean
R <sub>1</sub>	98.04 (82.09)	98.04 (82.09)	98.28 (83.71)	98.12 (82.63)	99.02 (86.11)	99.51 (87.99)	97.55 (81.24)	98.69 (85.11)	98.53 (84.10)	98.77 (85.04)	97.92 (82.48)	98.41 (83.87)
R <sub>2</sub>	98.04 (83.12)	97.55 (81.11)	97.55 (81.04)	97.71 (81.76)	93.63 (79.81)	96.57 (85.52)	95.59 (86.57)	95.26 (83.97)	95.83 (81.46)	97.06 (83.31)	96.57 (83.80)	96.49 (82.86)
R <sub>3</sub>	97.55 (83.32)	98.04 (83.26)	97.97 (81.63)	97.79 (82.40)	95.34 (77.55)	98.53 (85.13)	99.02 (86.11)	97.63 (82.93)	96.45 (79.94)	98.28 (84.19)	98.41 (83.87)	97.71 (82.67)
Mean	97.88 (82.51)	97.88 (82.15)	97.88 (82.13)		96.00 (81.16)	98.20 (86.21)	97.39 (84.64)		96.94 (81.83)	98.04 (84.18)	97.63 (83.38)	
	R	S	R X S		R	S	R X S		R	S	R X S	
F test	NS	NS	NS		NS	SIG	SIG		NS	NS	NS	
S.Em±	0.92	0.92	1.59		1.23	0.80	1.38		0.87	0.87	1.51	
CD at 5%	-	-	-		-	3.60	6.24		-	-	-	

(Figures in the parenthesis indicate arcsine transformed value)

R<sub>1</sub> – *Capsicum frutescens*, R<sub>2</sub> – Pusa Jwala, R<sub>3</sub> – Konkan Kirti

S<sub>1</sub> – NCH-1901, S<sub>2</sub> – Sitara, S<sub>3</sub> – Jalsa

**Table 4: Grafting success (%) at 9<sup>th</sup> day after grafting in chilli**

Treatment	20-21				21-22				Pooled			
	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	Mean	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	Mean	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	Mean
R <sub>1</sub>	91.42 (73.32)	90.93 (72.50)	91.42 (73.26)	91.26 (73.03)	94.61 (76.93)	95.34 (77.87)	94.61 (76.61)	94.85 (77.14)	93.01 (75.12)	93.14 (75.19)	93.01 (74.94)	93.06 (75.08)
R <sub>2</sub>	92.89 (74.87)	91.67 (73.49)	92.16 (73.88)	92.24 (74.08)	92.40 (75.39)	93.87 (79.58)	92.40 (78.69)	92.89 (77.89)	92.65 (75.13)	92.77 (76.53)	92.28 (76.29)	92.57 (75.98)
R <sub>3</sub>	91.42 (73.15)	92.89 (74.82)	91.67 (73.49)	91.99 (73.82)	92.16 (75.99)	95.10 (77.53)	95.10 (77.24)	94.12 (76.92)	91.79 (74.57)	94.00 (76.18)	93.38 (75.36)	93.06 (75.37)
Mean	91.91 (73.78)	91.83 (73.60)	91.75 (73.54)		93.06 (76.10)	94.77 (78.33)	94.04 (77.51)		92.48 (74.94)	93.30 (75.96)	92.89 (75.53)	
	R	S	R X S		R	S	R X S		R	S	R X S	
F test	NS	NS	NS		NS	NS	NS		NS	NS	NS	
S.Em±	0.52	0.52	0.91		0.80	0.80	1.38		0.44	0.44	0.76	
CD at 5%	-	-	-		-	-	-		-	-	-	

(Figures in the parenthesis indicate arcsine transformed value)

R<sub>1</sub> – *Capsicum frutescens*, R<sub>2</sub> – Pusa Jwala, R<sub>3</sub> – Konkan Kirti

S<sub>1</sub> – NCH-1901, S<sub>2</sub> – Sitara, S<sub>3</sub> – Jalsa

**Table 5:** Grafting success (%) at 12<sup>th</sup> day after grafting in chilli

Treatment	20-21				21-22				Pooled			
	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	Mean	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	Mean	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	Mean
R <sub>1</sub>	87.25 (69.33)	87.75 (69.63)	87.75 (69.65)	87.58 (69.54)	93.14 (74.91)	93.14 (75.09)	92.89 (74.56)	93.06 (74.85)	92.20 (72.12)	90.44 (72.36)	90.32 (72.11)	90.32 (72.20)
R <sub>2</sub>	86.76 (68.76)	85.54 (67.71)	86.76 (68.70)	86.36 (68.39)	92.40 (74.02)	93.87 (75.70)	92.40 (74.19)	92.89 (74.64)	89.58 (71.39)	89.71 (71.71)	89.58 (71.45)	89.62 (71.52)
R <sub>3</sub>	86.27 (68.32)	87.50 (69.40)	86.03 (68.06)	86.60 (68.59)	92.16 (73.77)	92.16 (73.93)	92.40 (74.02)	92.24 (73.90)	89.22 (71.04)	89.83 (71.66)	89.22 (71.04)	89.42 (71.25)
Mean	86.76 (68.80)	86.93 (68.91)	86.85 (68.80)		92.57 (74.23)	93.06 (74.90)	92.57 (74.26)		89.67 (71.52)	89.99 (71.91)	89.71 (71.53)	
	R	S	R X S		R	S	R X S		R	S	R X S	
F test	NS	NS	NS		NS	NS	NS		NS	NS	NS	
S.Em±	0.57	0.57	0.99		0.60	0.60	1.03		0.41	0.41	0.70	
CD at 5%	-	-	-		-	-	-		-	-	-	

(Figures in the parenthesis indicate arcsine transformed value)

R<sub>1</sub> – *Capsicum frutescens*, R<sub>2</sub> – Pusa Jwala, R<sub>3</sub> – Konkan KirtiS<sub>1</sub> – NCH-1901, S<sub>2</sub> – Sitara, S<sub>3</sub> – Jalsa**Table 6:** Grafting success (%) at 15<sup>th</sup> day after grafting in chilli

Treatment	20-21				21-22				Pooled			
	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	Mean	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	Mean	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	Mean
R <sub>1</sub>	82.11 (65.03)	84.56 (66.92)	83.82 (66.37)	83.50 (66.11)	88.73 (70.39)	90.69 (72.31)	87.50 (69.31)	88.97 (70.67)	85.42 (67.71)	87.62 (69.61)	85.66 (67.84)	86.23 (68.39)
R <sub>2</sub>	82.60 (65.39)	81.37 (64.47)	82.84 (65.54)	82.27 (65.13)	89.22 (70.86)	88.73 (70.42)	87.25 (69.12)	88.40 (70.13)	85.91 (68.12)	85.05 (67.45)	85.05 (67.33)	85.33 (67.63)
R <sub>3</sub>	82.11 (65.02)	83.33 (65.91)	83.09 (65.72)	82.84 (65.55)	88.48 (70.18)	88.24 (70.35)	88.48 (70.17)	88.40 (70.23)	85.29 (67.60)	85.78 (68.13)	85.78 (67.95)	85.62 (67.89)
Mean	82.27 (65.14)	83.09 (65.77)	83.25 (65.88)		88.81 (70.48)	89.22 (71.03)	87.75 (69.53)		85.54 (67.81)	86.15 (68.40)	85.50 (67.71)	
	R	S	R X S		R	S	R X S		R	S	R X S	
F test	NS	NS	NS		NS	NS	NS		NS	NS	NS	
S.Em±	0.41	0.41	0.70		0.62	0.62	1.07		0.34	0.34	0.59	
CD at 5%	-	-	-		-	-	-		-	-	-	

(Figures in the parenthesis indicate arcsine transformed value)

R<sub>1</sub> – *Capsicum frutescens*, R<sub>2</sub> – Pusa Jwala, R<sub>3</sub> – Konkan KirtiS<sub>1</sub> – NCH-1901, S<sub>2</sub> – Sitara, S<sub>3</sub> – Jalsa**Table 7:** Grafting survival (%) of chilli grafts at the time of transplanting

Treatment	20-21				21-22				Pooled			
	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	Mean	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	Mean	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	Mean
R <sub>1</sub>	79.17 (62.87)	80.64 (63.90)	80.39 (63.76)	80.07 (63.51)	85.05 (67.32)	87.99 (69.76)	85.29 (67.50)	86.11 (68.19)	82.11 (65.09)	84.31 (66.83)	82.84 (65.63)	83.09 (65.85)
R <sub>2</sub>	78.92 (62.68)	77.70 (61.84)	78.43 (62.33)	78.35 (62.28)	85.78 (67.89)	84.56 (66.87)	85.29 (67.47)	85.21 (67.41)	82.35 (65.28)	81.13 (64.35)	81.86 (64.90)	81.78 (64.84)
R <sub>3</sub>	77.70 (61.82)	78.43 (62.34)	77.45 (61.65)	77.86 (61.94)	85.05 (67.27)	84.56 (66.93)	85.78 (67.88)	85.13 (67.36)	81.37 (64.54)	81.50 (64.63)	81.62 (64.77)	81.50 (64.65)
Mean	78.59 (62.46)	78.92 (62.69)	78.76 (62.58)		85.29 (67.49)	85.70 (67.85)	85.46 (67.62)		81.94 (64.97)	82.31 (65.27)	82.11 (65.10)	
	R	S	R X S		R	S	R X S		R	S	R X S	
F test	SIG	NS	NS		NS	NS	NS		SIG	NS	NS	
S.Em±	0.32	0.32	0.55		0.48	0.48	0.84		0.26	0.26	0.45	
CD at 5%	0.93	-	-		-	-	-		0.76	-	-	

(Figures in the parenthesis indicate arcsine transformed value)

R<sub>1</sub> – *Capsicum frutescens*, R<sub>2</sub> – Pusa Jwala, R<sub>3</sub> – Konkan KirtiS<sub>1</sub> – NCH-1901, S<sub>2</sub> – Sitara, S<sub>3</sub> – Jalsa



**Table 8:** Girth (mm) of rootstock of various combinations of chilli grafts at the time of transplanting

Girth of rootstock at transplanting (mm)												
Treatment	20-21				21-22				Pooled			
	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	Mean	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	Mean	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	Mean
R <sub>1</sub>	2.03	2.39	2.40	2.27	2.07	2.45	2.36	2.29	2.05	2.42	2.38	2.28
R <sub>2</sub>	2.00	2.01	2.25	2.09	2.66	2.01	2.45	2.37	2.33	2.01	2.35	2.23
R <sub>3</sub>	2.31	2.20	2.38	2.29	2.35	2.14	2.51	2.33	2.33	2.17	2.45	2.31
Mean	2.11	2.20	2.34		2.36	2.20	2.44		2.23	2.20	2.39	
	R	S	R X S		R	S	R X S		R	S	R X S	
F test	SIG	SIG	SIG		SIG	SIG	SIG		SIG	SIG	SIG	
S.Em±	0.02	0.02	0.03		0.01	0.01	0.02		0.01	0.01	0.02	
CD at 5%	0.05	0.05	0.08		0.03	0.03	0.06		0.03	0.03	0.05	

R<sub>1</sub> – *Capsicum frutescens*, R<sub>2</sub> – Pusa Jwala, R<sub>3</sub> – Konkan Kirti  
 S<sub>1</sub> – NCH-1901, S<sub>2</sub> – Sitara, S<sub>3</sub> – Jalsa

**Table 9:** Length (cm) of tap root of various combinations of chilli grafts at the time of transplanting

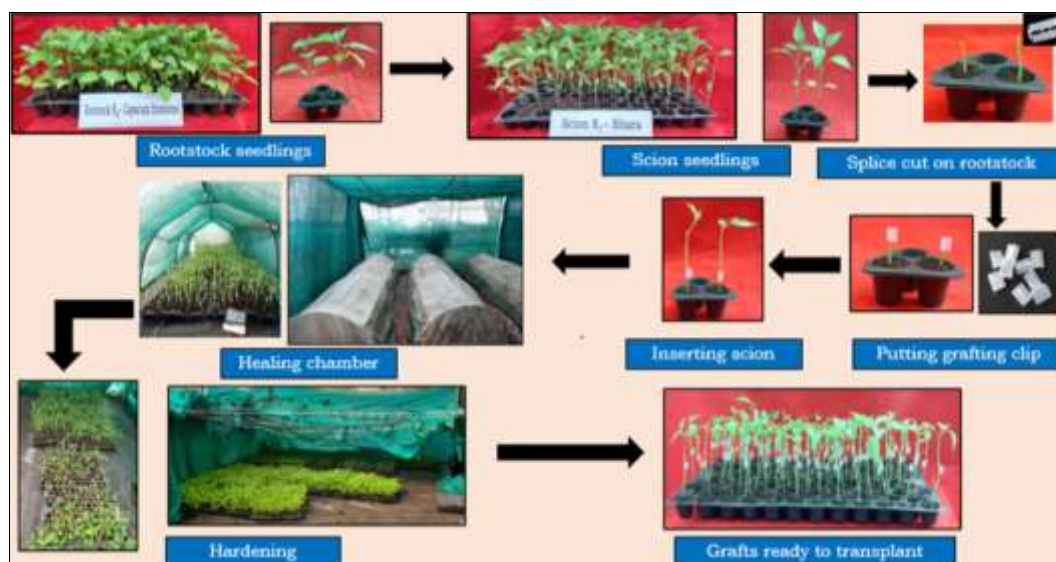
Length of tap root (cm)												
Treatment	20-21				21-22				Pooled			
	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	Mean	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	Mean	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	Mean
R <sub>1</sub>	17.29	15.55	16.60	16.48	18.05	15.45	17.60	17.03	17.67	15.50	17.10	16.76
R <sub>2</sub>	21.75	20.00	20.65	20.80	23.55	17.55	20.40	20.50	22.65	18.78	20.53	20.65
R <sub>3</sub>	18.40	15.85	14.60	16.28	17.65	13.45	12.50	14.53	18.03	14.65	13.55	15.41
Mean	19.15	17.13	17.28		19.75	15.48	16.83		19.45	16.31	17.06	
	R	S	R X S		R	S	R X S		R	S	R X S	
F test	SIG	SIG	SIG		SIG	SIG	SIG		SIG	SIG	SIG	
S.Em±	0.25	0.25	0.43		0.26	0.26	0.45		0.21	0.21	0.37	
CD at 5%	0.73	0.73	1.27		0.77	0.77	1.33		0.62	0.62	1.07	

R<sub>1</sub> – *Capsicum frutescens*, R<sub>2</sub> – Pusa Jwala, R<sub>3</sub> – Konkan Kirti  
 S<sub>1</sub> – NCH-1901, S<sub>2</sub> – Sitara, S<sub>3</sub> – Jalsa

**Table 10:** Number of adventitious roots in various combinations of chilli grafts at the time of transplanting

Number of adventitious roots												
Treatment	20-21				21-22				Pooled			
	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	Mean	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	Mean	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	Mean
R <sub>1</sub>	24.00	22.65	22.00	22.88	22.35	22.20	22.45	22.33	23.18	22.43	22.23	22.61
R <sub>2</sub>	25.65	23.60	25.10	24.78	36.80	22.40	26.80	28.67	31.23	23.00	25.95	26.73
R <sub>3</sub>	25.60	26.40	27.30	26.43	31.75	27.45	29.00	29.40	28.68	26.93	28.15	27.92
Mean	25.08	24.22	24.80		30.30	24.02	26.08		27.69	24.12	25.44	
	R	S	R X S		R	S	R X S		R	S	R X S	
F test	SIG	NS	SIG		SIG	SIG	SIG		SIG	SIG	SIG	
S.Em±	0.24	0.24	0.42		0.19	0.19	0.32		0.16	0.16	0.27	
CD at 5%	0.71	-	1.23		0.54	0.54	0.94		0.46	0.46	0.80	

R<sub>1</sub> – *Capsicum frutescens*, R<sub>2</sub> – Pusa Jwala, R<sub>3</sub> – Konkan Kirti  
 S<sub>1</sub> – NCH-1901, S<sub>2</sub> – Sitara, S<sub>3</sub> – Jalsa



**Plate 1:** Grafting procedure in chilli

## Conclusion

Thus, it was concluded that chilli grafts can be successfully prepared by splice grafting method. Further, no significant effect of rootstock, scion and their interaction was found on the grafting success in chilli. The rootstock effect on the grafting survival at 21 DAG was found significant where the highest grafting survival (83.09%) was recorded in *Capsicum frutescens* (R<sub>1</sub>) and the lowest (81.50%) in Konkan Kirti rootstock (R<sub>3</sub>). The effect of scion and interaction on grafting survival were found non-significant.

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