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EFFECT OF HARVESTING AT DIFFERENT NODES ON SPROUTING OF BUDS AND LATERAL GROWTH OF CARNATION (*DIANTHUS CARYOPHYLLUS* LINN.)

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Abstract

The present study was undertaken in a commercial floriculture farm under protected cultivation with three cultivars of carnation during July 2010 to February 2011. The experiment was laid out in randomized block design with factorial concept. The data recorded on sprouting of buds, lateral growth and internodal length at harvest revealed that harvest of flower stalk at 3rd node recorded significantly maximum and number of days for sprouting of buds was minimum with harvesting at 3rd node compared to other harvesting levels *i.e.* 2nd, 4th and at 5th nodes from the ground level.

Key words : Carnation, harvesting of flower stalk, nodes, cultivars.

Introduction

Carnation (*Dianthus caryophyllus* Linn. Fy: Caryophyllaceae) has been extensively cultivated for cut flowers in Columbia, Japan, Israel, Netherlands etc. A study indicated that about 34% of the total flower consumers expressed their liking for carnation compared to only 20% of the people who favoured roses (Staby *et al*., 1978). The maximum area under cultivation of carnation (2500 ha) is in Columbia (Bhattacharjee, 2006). In India, carnations are being grown in places like Nasik, Pune, Jammu & Kashmir, Himachal Pradesh and surrounding areas of Hyderabad in Andhra Pradesh (Mukherjee, 1996).

Application of various special horticultural practices after standardization can be one of the means to achieve the target of quality flower production. Carnation is a plurannual commercial cut flower crop exhibits apical dominance and development of lateral shoots and flower production are influenced by the presence of apical dominance (Cline, 1997). Generally carnation flowers are harvested at different heights or at different nodes without knowing its impact on growth and flower production in successive crop. To induce early sprouting of buds and transformation of laterals, the levels of harvest plays an important role and also have an impact on number of buds sprouting at the bottom or top of the left over harvested shoots, which finally determines the number of flower stalks produced per harvested stalk.

The buds sprouted at different levels have direct impact on the quality of flower stalk and flower bud. Organized research work in these lines on commercial cultivars of carnation is not available.

Materials and Methods

The experiment was conducted in three cultivars of carnation *i.e*., Domingo, Keiro and Dover during July 2010 to February 2011 in a Commercial Floriculture Farm at Mudimyal, Ranga Reddy district of Andhra Pradesh, India.

In this experiment, selected first season flower stalks of carnation were harvested at 2nd, 3rd, 4th and at 5th node from the ground level. Observations were recorded on number of days for sprouting of buds after harvest of flower stalk, number of buds sprouted per node, number of buds sprouted per plant, length of lateral at 20, 30, 40, 50, 60, 70 and 80 days after harvest of flower stalk and internodal length of flower stalk at the time of harvest.

Results and Discussion

The data pertaining to number of days for sprouting of buds after harvest of flower stalk of carnation are presented in table 1. There were significant differences in number of days for sprouting of buds after harvest of

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Table 1 : Effect of harvesting at different nodes on sprouting of buds in three cultivars of carnation.

Treatments	Number of days for sprouting of buds after harvest (days)				Number of buds sprouted per node				Number of buds sprouted per plant			
	Cultivars				Cultivars				Cultivars			
	Domingo	Keiro	Dover	Mean	Domingo	Keiro	Dover	Mean	Domingo	Keiro	Dover	Mean
2nd node	11.00[a]	15.50[c]	12.43[b]	12.97[d]	1.06	1.02	1.03	1.04[c]	2.15	2.01	2.05	2.07[d]
3rd node	6.66[a]	9.50[b]	7.56[a]	7.91[a]	1.21	1.06	1.11	1.12[a]	3.30	3.20	3.20	3.23[c]
4th node	7.96[a]	11.16[c]	9.53[b]	9.55[b]	1.09	1.04	1.06	1.06[b]	4.20	4.05	4.10	4.10[b]
5th node	10.56[a]	11.56[b]	10.76[a]	10.96[c]	1.11	1.03	1.06	1.06[b]	5.30	5.10	5.15	5.18[a]
Mean	9.05[a]	11.93[c]	10.07[b]	10.34	1.11[a]	1.03[c]	1.06[b]	1.07	3.73[a]	3.59[b]	3.62[b]	3.64
	Cultivars	Nodes	Cultivars × Nodes		Cultivars	Nodes	Cultivars × Nodes		Cultivars	Nodes	Cultivars × Nodes	
S.Em. ±	0.21	0.24	0.42		0.01	0.01	0.02		0.03	0.11	0.06	
CD (5%)	0.62	0.71	1.24		0.03	0.04	—		0.09	0. 38	—	

flower stalk of carnation due to harvesting at different nodes of flower stalk, cultivars studied and their interaction. Harvesting of flower stalk at 3rd node recorded significantly minimum number of days for sprouting of buds (7.91 days) followed by harvesting at 4th (9.55 days), 5th (10.96 days) and at 2nd node (12.97 days) from the ground level. Among the cultivars studied cv. Domingo (9.05 days) registered minimum number of days for sprouting of buds which differed significantly over Cvs. Dover (10.07 days) and Keiro (11.93 days).

The interaction between harvesting at different nodes of flower stalk and cultivars studied differed significantly on number of days for sprouting of buds. These results are in conformity with those reported by Rao *et al*. (2008) on carnation pinching at 10 cm height and at 3rd node recorded early sprouting of buds in cv. Domingo than other Cvs. Angelica and Golden Boy and with the findings of Jadhav *et al*. (2003) in roses.

The data pertaining to number of buds sprouted per node after harvesting of carnation are presented in table 1. There were significant differences in number of buds sprouted per node after harvesting of flower stalk of carnation due to harvesting at different nodes of flower stalk and cultivars studied. Harvesting of flower stalk at 3rd node (1.12) recorded significantly maximum number of buds sprouted per node. Among the cultivars studied, cv. Domingo (1.11) registered maximum number of buds sprouted per node, which differed significantly over the Cvs. Dover (1.06) and Keiro (1.03). It could be due to harvesting by leaving 3 nodes might have encouraged sprouting of all the axillary buds at each node and recorded maximum number of buds per node. These results are in conformity with Rao *et al*. (2008) in carnation Cvs. Domingo, Angelica and Golden Boy.

The data pertaining to number of buds sprouted per harvested stalk of carnation are presented in table 1. Harvesting of flower stalk at 5th node (5.18) recorded significantly maximum number of buds sprouted per harvested stalk. These results are in conformity with Beniwal *et al*. (2005) in chrysanthemum and Narayana Gowda (1991) in China aster. Similar results were also observed in rose by Uma and Gowda (1987).

The length of lateral at 80 days after harvest was found to be significant due to harvesting at different nodes of flower stalk and cultivars studied. The data are presented in table 2. Harvesting of flower stalk at 3rd node recorded maximum length of lateral (60.46 cm) which was significantly superior to harvesting of flower stalk at 4th (55.90 cm), 5th (51.65 cm) and at 2nd node (47.92 cm) from the ground level. Among the cultivars, cv. Domingo (61.58 cm) registered maximum length of lateral, which was significantly superior to rest of the Cvs. Dover (54.29 cm) and Keiro (46.08 cm). The interaction between harvesting of flower stalk at different nodes and cultivars studied differed significantly on length of lateral at 80 days after harvest. It could be due to less number of laterals and maximum utilization of available reserve food might have resulted in maximum growth of laterals. Similar increase in length of lateral was observed by Bunt (1980) in carnation cv. White Sim. These results are in conformity with Rao *et al*. (2008) in three cultivars of carnation.

The internodal length of lateral at the time of harvest was found to be significant due to harvesting at different nodes of flower stalk and cultivars studied. The data are

Table 2 : Effect of harvesting at different nodes on length of lateral (cm) and internodal length (cm) in three cultivars of carnation.

Treatments	Length of lateral at 80 days after harvest of flower stalk				Internodal length at the time of harvest of flower stalk			
	Cultivars				Cultivars			
	Domingo	Keiro	Dover	Mean	Domingo	Keiro	Dover	Mean
2nd node	53.93[a]	39.52[c]	50.33[b]	47.92[d]	5.58	4.90	5.10	5.19[d]
3rd node	68.56[a]	53.96[c]	58.86[b]	60.46[a]	8.00	7.31	7.26	7.52[a]
4th node	63.86[a]	48.70[c]	55.15[b]	55.90[b]	7.26	6.70	6.62	6.90[b]
5th node	59.96[a]	42.16[c]	52.83[b]	51.65[c]	6.50	5.21	5.96	5.89[c]
Mean	61.58[a]	46.08[c]	54.29[b]	53.98	6.87[a]	6.03[c]	6.23[b]	6.38
	Cultivars	Nodes	Cultivars × Nodes		Cultivars	Nodes	Cultivars × Nodes	
S.Em. ±	0.20	0.23	0.40		0.06	0.07	0.13	
C.D.	0.59	0.68	1.19		0.19	0.22	—	

presented in table 2. Harvesting of flower stalk at 3rd node (7.52 cm) recorded maximum internodal length of lateral, which was significantly superior to harvesting of flower stalk at 4th (6.90 cm), 5th (5.89 cm) and at 2nd node (5.19 cm) from the ground level. Among the cultivars, cv. Domingo (6.87 cm) registered maximum internodal length of lateral which was significantly superior to rest of the Cvs. Dover (6.23 cm) and Keiro (6.03 cm). These results are in conformity with Mukhopadhyay *et al*. (1987) in rose cv. Happiness.

Among the harvesting treatments imposed on carnation *i.e*., harvest of flower stalk at different nodes, harvest of flower stalk at 3rd node has shown early bud sprouting, good vegetative growth and maximum yield.

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