

## EVALUATION OF SOME CARNATION (*DIANTHUS CARYOPHYLLUS* L.) CULTIVARS UNDER MID HILLS CONDITION OF HIMACHAL PRADESH

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### ABSTRACT

The study was conducted with sixteen cultivars of carnation at Horticulture Research Station, Kandaghat (Solan) in 1999 and 2000 to ascertain the suitability of different cultivars for commercial cultivation. Cultivar 'Charmeur' gave the highest plant height (62.28 cm) as well as stem length (58.76 cm) while cultivar 'Irma' gave the highest overall number of 9.14 stem per plant. Cultivar 'Red Corso' recorded the earliest first flower bud opening in 160.47 days as well as longest duration of flowering for 24.15 days while cultivar 'Parini' recorded the maximum flower size of 8.01 cm in diameter.

### INTRODUCTION

Carnation (*Dianthus caryophyllus* L.) is one of the most important cut flower in the commercial trade today. Carnation ranks next to rose and chrysanthemum in the world's cut flower trade. This flower is mainly grown in temperate and sub-temperate region. However, in India carnation flowers are being grown in Himachal Pradesh, Bangalore, Pune, some parts of Nilgiri hills and Uttar Pradesh hills etc. Carnation is becoming a popular cut flower crop in Himachal Pradesh. There is vast scope of its cultivation in Shimla, Solan, Kulu, Sirmour and Palampur area. Keeping in view the importance of this crop, the present investigation was carried out to evaluate the suitable cultivars for commercial cultivation in this region.

### MATERIALS AND METHODS

The present experiment was conducted with 16 cultivars of carnation at the Horticultural Research Station, U.H.F, Kandaghat, Solan (H.P.) in 1999 and 2000 under open field condition. Healthy, uniform and disease free rooted cuttings of carnation were planted in the month of February at a distance of 20x20 cm. Well decomposed FYM (5kg/m<sup>2</sup>) and fertilizer comprising CAN (120 g/m<sup>2</sup>), SSP (125 g/m<sup>2</sup>) and MOP (17 g/m<sup>2</sup>) were applied in the field. The crops were raised following all the recommended package of practices to maintain the plant stand for all the cultivars. The experiment was replicated five times in

randomized block design. Observations on growth and flowering characters viz. plant height, stem length, number of stems per plant, days taken to first flower bud opening, flower size and duration of flowering were recorded from the five plants per cultivar per replication.

**Table 1. Performance of standard carnation cultivars for plant height, stem length and number of stems per plant under open field condition.**

Cultivars	Plant height			Stem length			Number of		
	(cm)			(cm)			stems/plant		
	1990	2000	Pooled Mean	1999	2000	Pooled Mean	1999	2000	Pooled Mean
Caberat	57.29	60.15	58.68	52.85	55.43	54.24	5.89	5.85	5.86
Charmeur	59.28	64.48	62.28	57.41	60.02	58.76	6.98	7.48	7.26
Espana	51.02	50.33	51.70	46.61	47.91	47.29	8.34	8.29	8.31
Candy	46.55	47.99	47.80	43.51	44.87	44.26	7.33	7.43	7.41
Leena	57.44	58.92	58.34	53.80	54.33	54.60	6.87	6.69	6.75
Parini	59.62	62.33	61.24	55.87	56.96	57.47	6.94	7.20	7.11
Pink Pusa	50.24	50.11	50.25	46.35	46.53	46.50	6.39	6.38	6.37
Pirandello	53.97	54.40	54.80	49.46	50.28	50.24	5.25	5.49	5.43
Scania	50.55	50.92	51.42	46.63	47.31	47.50	8.84	8.94	9.01
Yellow Dusty	43.01	42.82	43.44	38.70	38.48	39.10	6.57	6.77	6.72
White Candy	51.02	50.24	51.25	47.21	47.11	47.44	5.98	6.22	6.29
White Sim	48.22	49.54	49.50	44.74	45.39	45.52	8.39	8.48	8.51
Arthur Sim	55.56	56.06	56.09	51.65	52.05	52.18	8.95	8.89	9.10
Irma	43.59	44.77	44.60	39.96	40.68	40.95	9.00	0.08	9.14
Pamir	42.09	42.21	42.60	38.05	38.41	38.56	6.40	6.39	6.42
Red Corso	43.11	44.67	44.60	38.52	39.74	39.71	8.64	8.81	8.77
CD <sub>(0.05)</sub>	1.31	1.29	1.06	1.21	1.25	1.02	1.91	1.88	1.36

## RESULTS AND DISCUSSION

It is evident from the Table 1 that the evaluation of sixteen carnation cultivars. In the first year the maximum plant height was attained by cultivar Parini (59.62 cm) closely followed by 'Charmeur' while in the second year, 'Charmeur' recorded the highest plant height of 64.48 cm followed by 'Parini' (62.33) cm. However, average plant height ranged from 42.60-62.28 cm and 'Charmeur' produced the maximum plant height (62.28 cm) followed by 'Parini' (61.24 cm) and 'Caberat' (58.68) whereas 'Pamir' (42.60 cm) was the shortest. Klapwijk (1987) reported that the maximum growth period implied a pinching date in the first week of November when plants were pinched between October and March, the period till flower initiation decreased with exactly one day for every day pinching was delayed. Gill and Arora (1988) observed rapid elongation of shoots in November. Another

period of outline growth observed was from February to March. Carnation plants tolerate extremely high temperature 46° C and also sustained some growth during November. Maximum stem length was recorded in 'Charmeur' and 'Parini' in the both year. The stem length in the cultivars ranged from 38.56-58.76 cm. (Table 1). Bunt (1973) reported shoot length of 87.20 cm in November planting while Vidalie (1982) reported flower stems of 72.36 cm in cultivar 'Le Reve' and 70.16 cm in 'Scania' under glasshouse condition. Namikawa (1980) reported reduced stem length by increasing natural day length to 16 hours. Gill and Arora (1988) obtained flowers with longest stem from October planting and with shortest stem length from April planting. Hanan (1959) reported that stem length increased with increasing temperature. The overall number of stems per plant was ranged from 5.43-9.14 and the highest stems per plant was recorded in 'Irma' (9.14) followed by 'Arthur 'Pirandello' (5.43). In the first year maximum number of stems per plant was recorded in 'Parini' (9.00) and 'Arthur Sim' (8.95) while in the second year 'Irma' (9.08) and 'Scania' (8.94) recorded the highest number of stems per plant.

**Table 2. Performance of standard carnation cultivars for days taken to first flower bud opening, flower size and duration of flowering under open field condition**

Cultivars	Days taken to first flowering bud opening			Flower size (cm)			Duration of flowering (days)		
	1990	2000	Pooled Mean	1999	2000	Pooled Mean	1999	2000	Pooled Mean
Caberat	169.95	170.88	170.72	7.38	7.58	7.50	18.11	18.20	18.08
Charmeur	171.78	172.36	172.44	6.98	7.21	7.05	23.10	22.94	23.02
Espana	161.11	163.66	162.56	5.99	5.78	5.98	21.21	20.99	21.14
Candy	172.03	172.21	172.34	6.03	5.91	6.07	19.05	19.15	19.11
Leena	171.41	172.85	172.50	5.79	5.57	5.70	22.16	22.00	22.06
Parini	161.07	161.23	161.75	7.95	8.19	8.01	23.87	24.50	24.03
Pink Pusa	170.64	169.34	170.20	7.09	6.84	7.00	20.85	21.20	21.00
Pirandello	162.90	162.24	162.80	5.95	5.78	5.92	22.14	22.00	22.07
Scania	160.20	162.21	161.24	6.63	6.75	6.70	18.41	18.05	18.23
Yellow Dusty	183.40	183.53	183.72	6.51	6.53	6.50	15.29	15.45	15.34
White Candy	175.63	174.70	175.50	6.45	6.59	6.52	22.46	22.65	22.50
White Sim	167.49	169.03	168.90	6.68	6.85	6.72	17.44	17.69	17.52
Arthur Sim	171.71	172.26	172.03	6.85	6.91	6.90	23.83	24.05	24.01
Irma	168.11	167.84	168.21	6.31	6.19	6.24	14.81	15.31	15.06
Pamir	164.48	165.71	165.39	6.25	6.30	6.29	15.92	15.62	15.77
Red Corso	160.19	159.85	160.47	6.89	6.99	6.92	25.00	24.02	24.15
CD <sub>(0.05)</sub>	1.02	1.01	0.79	1.14	1.15	0.96	1.94	1.91	1.63



The minimum duration to first flower bud opening was recorded in 'Red Corso' (160.19 days) followed by 'Scania' (160.20 days) in both years days to first flower bud opening was ranged from 161.75-183.72 days Harris and Ashford (1966) found that photoperiod had little or no effect on the flower development. Abou Dahab (1967) reported a negative relationship between day length and time from initiation of anthesis while Cheng and Lenghans (1971) found a positive relationship. Hennis et al. (1979) and Hanan (1987) observed that long photoperiod hastened flower initiation while short photoperiod delays it. Flower size for two years varied from 5.70-8.01 cm and mostly flower had more than 6. cm in size. Largest flower size was recorded in 'Parini' (8.01 cm) in diameter followed by 'Caberat' (7.50 cm) and 'Charmeur' (7.05 cm) while smallest was in 'Leena' (5.70 cm) (Table 2). Boikov (1992) reported that the Bulgarian carnation produced flower more than 12 cm in diameter. Gill and Aorora (1988) reported flower size raning from 6.7-8.4 cm under open filed condition. Longest duration of floweing in the first year was recorded in 'Red Corso' followed by 'Parini' while in the second year, 'Parini' and 'Arhtur Sim' recorded the maximum. (Table 2). Klapwijk (1987) reported that the period between microscopically visible flower initiation to full bloom did not respond to day length but varied with the seasonal variation in solar radiation. Gill and Arora 91988) reported that the duration of flower availability might be longer in closer planting in December.

In may be concluded that the mid hills of Himachal Pradesh can be conveniently exploited for commercial cultivation of carnation during summer season. The cultuvars like 'Parini', 'Caberat', 'Leena', 'Pirandello', 'Scania', 'Arthur Sim', 'Red Corso', 'Charmeur' etc. from the point of floral and growth performances can be recommended for the mid hills area of Himachal Pradesh.

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