



QUALITY OF BLOOM IN ASIATIC LILY HYBRIDS

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Abstract

The present investigation was conducted in two different growing seasons *kharif* and winter season during 2013-2014 in the terrace garden of the Department of Floriculture and Landscaping, College of Agriculture, Orissa University of Agriculture and Technology, Bhubaneswar with five Asiatic lily hybrid varieties *viz* New Wave, Orange Matrix, Alaska, Nov Cento and Monte Negro. The trial was laid out in the form of a factorial randomized block design with three replications. The data was recorded for nine growth and floral parameters. Results of the study indicated that variety New Wave (V1) grown under S1 *i.e.* *Kharif* season was earlier in the appearance of flower buds. Variety Monte Negro (V5) grown under winter season produced maximum number of flower buds per shoot. Variety Nov Cento (V4) grown under *Kharif* season recorded maximum flower bud length (10.20 cm). Whereas maximum flower bud width was recorded in Variety New Wave under winter season. Number of days taken for bud break from appearance of flower bud was earliest in variety Monte Negro under *Kharif* season. Variety Orange Matrix (V2) under winter season recorded maximum flower length (12.25 cm) and flower width (16.88cm). Variety Monte Negro recorded maximum bloom life (6.47 days) under winter season.

Key words : Asiatic lily, factorial randomized block design, bloom quality, growing seasons.

Introduction

Lilium is one of the important geophytes, endowed with showy flowers, appealing colour patterns and durable spikes. It is regarded as one of the ten most superior cut flowers in the world (Thakur *et al.*, 2005). As a garden plant, lilies are best suited for growing in beds, borders and in pots. The genus Lilium of the family liliaceae comprises more than 80 species and these are divided into seven sections (Comber, 1949). In the language of flowers, the lily is the symbol of purity and innocence. Lilium deserves to be called the aristocrat of the plant world. Through forcing, these can be marketed throughout the year. It is being commercially cultivated in different parts of India such as Nilgiris, Shevroy Hills, Himachal Pradesh, North Eastern states, Jammu and Kashmir etc. So far as Odisha is concerned, Lilium is recent introduction. Therefore information on quality of bloom in Asiatic lily hybrids in different growing seasons could be helpful for growing successfully on commercial scale for cut flower production. Therefore, the present experiment was conducted to study the quality of bloom in Asiatic lily hybrids.

Materials and Methods

The experiment was carried out during the *kharif* and winter seasons in 2013-2014 at the Department of Floriculture and Landscaping, College of Agriculture, Orissa University of Agriculture and Technology, Bhubaneswar (20°25' N latitude and 85°52' E longitude at an altitude of 25.5m above the mean sea level), Odisha, India. Bulbs of five Asiatic lily hybrid varieties *viz.*, New Wave, Orange Matrix, Nov Cento and Monte Negro with five different colours such as white, orange, pink, yellow and red were respectively selected for the experiment. The bulbs were planted in the pots filled with the media comprising of soil: cocopeat: sand in 2:1:1 ratio (v/v). The experiment was laid out in the form of a factorial experiment in completely randomized block design. All the cultural practices, were followed and data were recorded for nine growth and floral parameters *viz.*, plant height (cm), leaf area (cm²), basal stem diameter (cm), days taken for bud formation, days taken for bud break, flower bud size (cm), flower width and length (cm), bloom life (in days).

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Results and Discussion

Significant differences were recorded among the varieties for most of the characters in different growing seasons indicating that the varieties included in the experiment were having appropriate variation in different growing seasons and hence were suitable for growing in two different growing seasons. The results of the study are presented in tables 1 and 2.

The data revealed that the maximum plant height (30.87 cm) was recorded in V1 (New Wave), which was followed by Nov Cento (30.41 cm) which were at par with each other. The minimum plant height was recorded with V5 i.e. Monte Negro (11.64 cm). Sindhu and Singh (2012) reported similar variation in plant height of different varieties of lily under northern plains. Plant height was

maximum (25.83 cm) in plants grown under S1 i.e. *kharif* season while the minimum (18.54 cm) was recorded under S2 i.e. winter season. Similar variation was reported in tuberose by Padaganur *et al.* (2005). So far as interaction was concerned, variety Nov Cento performed better (40.24 cm) under S1 i.e. *kharif* season.

The results of the study revealed that the variety Orange Matrix (V2) recorded the maximum leaf area (17.69 cm²) which differed significantly from other varieties. Variety Monte Negro (V5) recorded minimum (8.26 cm²) leaf area. Kumari *et al.* (2010) reported variation in leaf area of gerbera among different cultivars. Plants grown under winter season recorded maximum leaf area. Interaction effect of variety with growing seasons on leaf area was significant. Variety Orange

Table 1 : Comparative performance of Asiatic hybrid lily varieties in different growing seasons with respect to different plant characters.

Treatment	Plant height (cm)	Leaf area (cm ²)	Basal stem diameter (mm)	Days taken for bud formation	Days taken for bud break from appearance of flower bud
Variety (V)					
V1	30.87	14.98	0.81	30.59	26.37
V2	16.51	17.69	0.77	47.38	24.59
V3	21.51	13.40	0.80	39.16	24.86
V4	30.41	13.62	0.83	35.75	24.50
V5	11.64	8.26	0.68	46.95	22.22
SEm±	1.59	0.85	0.29	2.21	0.72
CD _{0.05}	4.77	2.56	0.08	6.64	2.18
Season (S)					
S1	25.83	11.66	0.78	36.28	22.77
S2	18.54	15.52	0.77	43.65	26.24
SEm±	1.00	0.54	0.01	1.40	0.46
CD _{0.05}	3.02	1.62	NS	4.20	1.38
Variety × Season (V×S)					
V1S1	36.29	14.38	0.82	25.66	23.33
V2S1	18.47	12.83	0.77	44.16	23.63
V3S1	24.80	13.90	0.82	36.38	23.22
V4S1	40.24	9.81	0.82	26.41	22.33
V5S1	9.37	7.39	0.70	48.80	21.33
V1S2	25.45	15.57	0.79	35.52	29.41
V2S2	14.56	22.56	0.77	50.61	25.55
V3S2	18.22	12.90	0.77	41.94	26.50
V4S2	20.58	17.44	0.84	45.08	26.66
V5S2	13.91	9.14	0.66	45.11	23.11
SEm±	2.25	1.21	0.04	3.13	1.03
CD _{0.05}	6.75	3.62	NS	9.40	NS

NS= Non-significant, V1= New Wave, V2= Orange Matrix, V3= Alaska, V4= Nov Cento, V5 = Monte Negro, S1= *Kharif* season, S2= Winter season.

Table 2 : Comparative performance of Asiatic hybrid lily varieties in different growing seasons with respect to different floral characters.

Treatment	Flower bud length (cm)	Flower bud width (cm)	Length of flower (cm)	Width of flower (cm)	Length of flowering shoot (cm)	Bloom life
Variety (V)						
V1	9.55	5.00	10.65	16.64	44.68	5.61
V2	9.65	4.51	12.25	16.28	31.76	5.30
V3	9.82	5.00	11.53	14.78	43.47	5.93
V4	9.10	4.61	10.86	15.65	48.34	4.65
V5	8.20	4.10	9.46	14.25	21.53	6.47
SEm±	0.29	0.19	0.21	0.29	1.25	0.31
CD _{0.05}	0.86	0.57	0.63	0.89	3.72	0.94
Season (S)						
S1	9.28	4.54	10.67	15.23	42.79	4.63
S2	9.24	4.75	11.23	15.81	33.12	6.55
SEm±	0.18	0.12	0.13	0.18	0.79	0.20
CD _{0.05}	NS	NS	0.39	0.56	2.35	0.60
Variety × Season (V×S)						
V1S1	9.37	4.58	10.68	16.51	51.71	4.92
V2S1	9.35	4.28	11.45	15.69	30.92	4.55
V3S1	10.20	5.04	11.55	14.77	50.15	5.25
V4S1	8.94	4.39	10.65	15.42	58.42	4.17
V5S1	8.54	4.43	9.01	13.76	22.76	4.28
V1S2	9.72	5.43	10.65	16.76	37.66	6.30
V2S2	9.95	4.74	12.25	16.88	32.61	6.05
V3S2	9.43	4.97	11.53	14.79	36.80	6.61
V4S2	9.25	4.83	10.86	15.89	38.27	5.14
V5S2	7.86	3.76	9.46	14.75	20.30	8.67
SEm±	0.40	0.27	0.29	0.42	1.77	0.44
CD _{0.05}	NS	NS	NS	NS	5.26	1.33

NS= Non-significant, V1= New Wave, V2= Orange Matrix, V3= Alaska, V4= Nov Cento, V5= Monte Negro, S1= *Kharif* season, S2= Winter season.

Matrix (V2) recorded maximum leaf area (22.56 cm²) under S2 i.e. winter season.

Variety Nov Cento (V4) recorded the maximum (0.83 mm) basal stem diameter and minimum (0.68 mm) was recorded in variety Monte Negro (V5). Growing seasons and various combinations of varieties and seasons had no significant influence on basal stem diameter. However, the maximum basal stem diameter was recorded in variety Nov Cento grown under winter season and the minimum was recorded in variety Monte Negro under the same season.

Variety New Wave (V1) was the earliest (30.59 days) to produce flower bud. Variety Orange Matrix (V2) took maximum number of days to produce flower bud (47.38 days). Similar results were also obtained by Lalan Kumar

et al. (2010) in dahlia and Barik (2013) in Asiatic lily hybrids. Significant difference was noticed among the two growing seasons so far as days taken for appearance of flower bud were concerned. It was earlier in S1 i.e. *kharif* season (36.28 days) as compared to winter season (43.65 days). Similar results have been reported by Muhammad *et al.* (2013), who recorded earlier spiking in gladiolus under warmer temperature.

All the cultivars under study differed significantly with respect to days taken for bud break from appearance of flower bud. Variety Monte Negro (V5) was the earliest (22.22 days) for bud break. Whereas the maximum delay (26.37 days) was noticed in variety New Wave (V1). Pandey *et al.* (2012) reported the same variation in gladiolus. Days taken for bud break from the date of

appearance of flower bud was significantly less for plants grown under S1 *i.e.* *kharif* season as compared to winter season, since the appearance of flower bud was observed to be earlier under *kharif* season.

Flower bud length and width in different Asiatic lily varieties differed significantly. Maximum length was recorded in variety Alaska (9.82 cm) and maximum width (5.00 cm) was recorded in varieties Alaska and New Wave. While the minimum values (8.20 cm length and 4.10 cm width) were recorded in variety Monte Negro.

So far as length and width of flower was concerned, var. Orange Matrix (V2) and var. New Wave (V1) recorded maximum length (12.25 cm) and width (16.64 cm) respectively which differed significantly from the others. The minimum was observed in var. Monte Negro (V5) which recorded a value of 9.46 cm and 14.25 cm (length and width, respectively). Similar variation in cultivars of dahlia with respect to flower diameter was reported by Lalan Kumar *et al.* (2010). Highest length and width of flowers were recorded under S2 *i.e.* winter season as compared to S1 *i.e.* *kharif* season.

Significant variation in length of flowering shoot was observed due to different varieties tried. Maximum length of flowering shoot (48.34 cm) was recorded in the variety Nov Cento (V4) followed by variety New Wave (44.68 cm) and both were at par with each other. Whereas shorter shoot length (21.53 cm) was recorded in variety Monte Negro (V5). Maximum length of flowering shoot was recorded under S1 *i.e.* *kharif* season while the minimum was recorded under S2 *i.e.* winter season. Muhammad *et al.* (2013) reported shortening of gladiolus spikes under low temperature conditions.

Significant variation was observed among the varieties with respect to bloom life. The maximum bloom life (6.47 days) was recorded in Monte Negro (V5), which was followed by Alaska (5.93 days) and New Wave (5.61 days) whereas the lowest was recorded in Nov Cento (V4), which had a bloom life of 4.65 days only. Variation in bloom life among the liliium varieties as observed in the present study is attributed to the difference in genetic makeup of the varieties and further might be due to its interaction with the growing season. Wide variation in floral parameters of liliium due to varieties has also been reported by Dhiman (2003). Different growing seasons also had significant influence on bloom life. The maximum (6.55 days) bloom life was recorded in plants grown under S2 *i.e.* winter season whereas the minimum (4.63 days) was under S1 *i.e.* *kharif* season. Interaction of variety

and season also had significant influence on bloom life. Monte Negro (V5) grown in winter recorded highest (8.67 days) bloom life. Irrespective of season, Monte Negro (V5) had the highest bloom life and irrespective of variety bloom life was highest under winter. Therefore obviously it would be expected that V5 × S2 should have produced the highest bloom life. On the other hand the lowest (4.17 days) bloom life was recorded in Nov Cento (V4) grown in *kharif* season.

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