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INFLUENCE OF SPACING AND NITROGEN ON FLOWER QUALITY AND VASE LIFE OF ASIATIC LILY CV. GIRONDE

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ABSTRACT : The study on influence of spacing and nitrogen on flower quality and vase life of Asiatic lily cv. Gironde was carried out in UHS, Bagalkot during 2012-2013 and nitrogen levels *viz.,* on flower quality and vase life of flowers. All twelve possible combinations of the spacing S_1 to S_3 (30x15 cm, 30x30 cm and 40x15 cm) and nitrogen levels N_1 to N_4 (0, 100, 150 and 200kg/ha) were laid in combination as per treatments in Factorial Randomized Block Design (FRBD) with three replications. The quality parameters and vase life of Asiatic lily were significantly influenced by spacing and nitrogen. Spacing of 30x15 cm and nitrogen level of 200 kg per ha were found excellent when compared to others. The interaction between spacing and nitrogen exhibited significant enhancement in bud diameter.

Keywords : *Asiatic lily, flower quality, vase life, spacing, nitrogen.*

Globally growing floriculture industry has achieved significance during the past few decades. At present, cut flower production focus has moved from traditional growers, such as the Netherlands, Germany and France, to countries like African countries and some of the Asian countries where the climates are better and production costs are low. In India, there has been a dynamic shift from sustenance production to commercial production of commercial flowers.

Asiatic lily, a member of the family Liliaceae, has its elegant flower spikes which have rich variation of colours and long vase life, is commercially grown for its fascinating flowers which are used as the most preferred line flowers in floral arrangements worldwide. To achieve production of quality spikes improved crop management techniques need to be standardized for every new location where the crop is grown. Besides the climatic condition, the plant spacing and nitrogen plays important role in quality of flowers. The basic crop management practices like plant spacing and nitrogen doses are not yet standardized for cultivating this crop in a commercial scale at Karnataka condition. Hence, the present investigation was undertaken to study the effect of spacing and nitrogen levels on quality and vase life of Asiatic lily cv. Gironde.

MATERIALS AND METHODS

The field experiment was conducted during 2012-2013 in University of Horticultural Sciences, Bagalkot. There were a total of twelve treatments replicated three times in a Factorial Randomized Block Design (FRBD). Three different plant spacing *viz.,* S_1- 30 x 15 cm, S_2-30 x 30, S_3- 40 x 15 cm, and four different nitrogen doses *viz.,* N_1 to N_4 (0, 100, 150 and 200 kg/ha) in twelve possible combinations were adopted as treatments. The quality parameters and vase life of flowers were recorded and the data were analyzed using the analysis of variance.

RESULTS AND DISCUSSION

Effect of Spacing and Nitrogen

All the quality parameters viz., length and diameter of flower stalk, flower bud and vase life of Asiatic lily were significantly influenced by spacing and nitrogen levels individually (Table 1).

Maximum length of flower stalk (44.23 cm) was recorded at S_1 spacing which was on par at S_3 spacing (43.73 cm) and S_2 spacing (39.93 cm). This might be due to the fact that optimum use of all resources under closer spacing. This resulted in elongation of main stalk confirming to observations made by Mane *et al.* (4) in tuberose. Maximum length of flower stalk (34.70 cm) was recorded at N_4 level of nitrogen followed by N_3 level (33.27 cm), while minimum mean length of flower stalk (28.88 cm) was recorded at N_1 level. Nitrogen was absorbed by the plants and thereby stimulated plant growth and induced the production of auxiliary buds resulting in increased flower stalk height. Results are in consonance with Rathore and Singh (6) and Singh (7).

Increasing nitrogen levels up to 200 kg per ha significantly increased flower stalk diameter from 0.27 cm to 0.44 cm. The increase in growth characters and yield components from increased nitrogen level might be due to the role of nitrogen in stimulating vegetative growth. The hypothesis is that nitrogen is a constituent

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of protein, nucleic acids and nucleotides that are essential to the metabolic function of plants (Khalaj and Edrisi, 3).

Data (Table 1) also confirmed that the maximum flower stalk diameter (0.51 cm) was produced at the closer spacing (30 x 15 cm) compared to the minimum (0.43 cm) flower stalk diameter at the wider spacing of 30 x 30 cm. The results are in support of Mane *et al.* (5).

Maximum diameter of bud (1.63 cm) was recorded at 30x15 cm spacing compared to the least diameter (1.28 cm) at wider spacing of 30 x 30 cm. Maximum diameter of bud (1.31 cm) was recorded at 200 kg per ha level of nitrogen followed by 150 kg per ha (1.09 cm) and 100 kg per ha (1.00 cm), while minimum mean diameter of bud (0.93 cm) was recorded at N_1 level (Table 1). This might be due to the fact that optimum utilization of resources.

Maximum length of bud (5.43 m) was recorded at closer spacing (30 x 15 cm) which was on par with S_3 spacing (5.14 cm) and least length of bud (4.60 cm) was recorded under 30 x 30 cm spacing. Maximum length of bud (4.47 cm) was recorded at N_4 level of nitrogen which was on par at N_3 level (4.05 cm), while minimum mean length of bud (3.10 cm) was recorded at N_1 level. This might be due to the fact that optimum utilization of resources. This resulted in elongation of bud length, increase in bud length may be due to elongation of cells and number of cells due to cell division. Similar observations had also been made by

Table 1: Effect of spacing and nitrogen levels on quality parameters and vase life of Asiatic lily.

Treatment	Length of flower stalk (cm)	Diameter of flower stalk (cm)	Bud diameter (cm)	Bud length (cm)	Vase life (days)
Spacing (cm)					
S_1= 30 x15	44.23	0.51	1.63	5.43	6.75
S_2= 30 x 30	39.93	0.43	1.28	4.60	5.93
S_3= 40 x15	43.73	0.47	1.41	5.14	6.59
C.D. (P=0.05)	3.12	0.04	0.12	0.45	0.42
Nitrogen levels (kg/ha)					
N_1=0	28.88	0.27	0.93	3.10	4.23
N_2=100	31.04	0.31	1.00	3.54	4.58
N_3=150	33.27	0.40	1.09	4.05	5.06
N_4=200	34.70	0.44	1.31	4.47	5.40
C.D. (P=0.05)	3.60	0.04	0.14	0.52	0.49
Interaction (S x N)					
S_1N_1	38.90	0.39	1.27	4.37	6.13
S_1N_2	42.43	0.45	1.48	5.00	6.23
S_1N_3	46.23	0.58	1.74	5.81	6.89
S_1N_4	49.33	0.63	2.01	6.53	7.74
S_2N_1	36.73	0.31	1.21	3.97	5.13
S_2N_2	39.80	0.39	1.25	4.40	5.99
S_2N_3	40.73	0.49	1.28	4.77	6.25
S_2N_4	42.47	0.53	1.39	5.27	6.35
S_3N_1	39.87	0.36	1.23	4.07	5.64
S_3N_2	41.93	0.40	1.27	4.77	6.10
S_3N_3	46.10	0.52	1.32	5.63	7.10
S_3N_4	47.00	0.59	1.83	6.10	7.53
C.D. (P=0.05)	NS	NS	0.25	NS	NS

Karavadia and Dhaduk (1) in chrysanthemum, Karthikeyan and Jawaharlal (6) in carnation and Mane *et al.* (4) in tuberose.

Maximum vase life of flowers (6.75 days) was recorded at S_1 spacing which was on par at S_3 spacing (6.59 days) and least vase life under S_2 spacing (5.93 days). The vase life increased with a decrease of plant spacing (Mane *et al.,* 5).

With respect to nitrogen levels, maximum vase life of flower (5.40 days) was recorded at 200 kg/ha (N_4) level of nitrogen which was on par with 150 kg/ha level (5.06 days), while minimum vase life of flower (4.23 days) was recorded at control (0 kgN/ha). It could be due to the fact that more number of flower buds and flowers per spike, maximum weight of flowers and also bigger sized flowers in the spike (Khalaj and Edrisi, 3). Increase in vase life of tuberose flowers due to higher nitrogen level had also been reported by Rathore and Singh (6).

Interaction Effect of Spacing and Nitrogen

The interaction effect of nitrogen levels and spacing showed significant differences with respect to bud diameter. The biggest sized (2.01 cm) buds were obtained from treatment combination of 200 kgN/ha (N_4)) and S_1 (30 x 15cm) spacing which was on par with S3N4 combination (1.83 cm), while the lowest bud diameter (1.21 cm) was recorded in combination of N_1 and S_2 (Table 1).

The interaction effect of nitrogen levels and spacing showed non-significant differences with respect to length and diameter of flower stalk, length of flower bud and vase life of flowers.

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