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RESEARCH ARTICLE

INFLUENCE OF ORGANIC NUTRIENTS AND GIBBERLLIC ACID ON THE GROWTH, FLOWERING AND QUALITY ATTRIBUTES OF ENGLISH CAPE LILY (*Crinum* Spp)

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ABSTRACT

An experiment was carried out to study the influence of organic nutrients and Gibberllic acid on the performance of English cape lily (*Crinum* spp) . Among the treatments, it can be concluded that the organic manure *viz.*, Farmyard manure @ 15 t ha^{-1} along with foliar application of Gibberllic acid @ 500 ppm was found most effective in maximizing the days taken for sprouting (10.12 days), plant height (66.12 cm), number of leaves (22.57 $plant^{-1}$) and leaf area (246.12 cm^2) . Flower parameters *viz.,* days taken for spike emergence 27.69 days, Days taken for floret open (32.36 days) , spike length (57.28 cm), flower length (12.88 cm) and vase life (12.59 days). The growth, flowering and quality parameters of English cape lily was minimum in control. Thus the present investigation clearly indicate that application of farmyard manure @ 15 t ha^{-1} and GA_3 @ 500 ppm could adjudged as the best treatment in performance of English cape lilly.

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INTRODUCTION

English cape lily (*crinum spp.*) belongs to the family Amaryllidaceae is one of the leading cut flowers all over the world. It is usually cultivated as cut flowers and potted plants. Botanically, *Crinums* are perennial herbaceous plants with giant fleshy bulbs larger in stature. Organic manure has received considerable attention by the farmers as a source of nutrients for enhanced plant growth and productivity. They help in supplying a balanced nutrition of the growing plants and improve the production and quality of crop (Eswaran, 2002). Plant growth regulators are the organic chemical compounds which modify or regulate physiological process in an appreciable measure in plants when used in small concentrations gained wide acceptance in many flower crops. They are readily absorbed and move rapidly through tissues when applied to different parts of the plant (Baskaran and Misra. 2007). In light of these facts, an attempt was aimed towards finding of appropriate concentration of gibberllic acid with relevant quantity of organic manures on the performance of English cape Lilly.

MATERIALS AND METHODS

The investigation was under taken to study the effect of Gibberllic acid and organic nutrients on the performance of English cape lily (*Crinum* spp) in the Department of Horticulture, Faculty of Agriculture, Annamalai nagar. The experiment was laid out in Randomized Block Design (RBD) with 10 treatment and replicated three times. The organic manures *viz*, Vermicompost @ 2, 2.5and 3 t ha^{-1}, Farmyard manure@ 10, 12.5 and 15 t $ha^{-1}$and coir pith compost @ 3, 5 and 10 t ha^{-1} along with foliar application of Gibberllic acid (GA_3) @ 500 ppm were taken for study. uniform bulb size of 10 cm in diameter was taken and planted with a spacing of 30 cm x 30 cm. organic manures was applied during the preparation of field as per the treatment schedule. Growth regulator were sprayed at 45, 60 and 90 days after planting of bulbs. The observation are recorded on the selected five plants for a treatment in each replication and the mean data is statistically analyzed.

RESULTS AND DISCUSSION

The *per se* effect of various organic nutrients clearly indicated that by treating with GA_3 have a complementary or synergistic effect an growth , flower and quality parameters could be archived. The data and the result on the effect of Gibberllic acid and organic nutrients on the performance of English cape lily (*Crinum* spp) is present in the table (1&2) observation were recorded on growth, flower and quality attributes. The results revealed that application of farmyard manure @ 15 t ha^{-1} and GA_3 @ 500 ppm was found to be beneficial in improving the growth and performance of lily.

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Table 1. Influence of organic nutrients and Gibberllic acid on growth parameters in English cape lilly (*crinum* spp)

Treatments	Sprouting Of bulbs (days)	Plant height (cm)	Number of leaves per plant	Leaf area (cm^2)
T_1 – Vermicompost 2 t ha^{-1}+ GA_3 @ 500 ppm	17.05	57.85	15.19	203.45
T_2 – Vermicompost 2.5 t ha^{-1}+ GA_3 @ 500 ppm	13.07	63.24	19.79	231.67
T_3 – Vermicompost 3 t ha^{-1}+ GA_3 @ 500 ppm	12.41	63.83	20.29	234.80
T_4- Farmyard manure 10 t ha^{-1}+ GA_3 @ 500 ppm	15.73	60.24	17.23	215.98
T_5 - Farmyard manure 12.5 t ha^{-1}+ GA_3 @ 500 ppm	14.40	62.64	19.28	228.53
T_6 - Farmyard manure 15 t ha^{-1}+ GA_3 @ 500 ppm	10.12	66.12	22.57	246.12
T_7 – Coirpith compost 3 t ha^{-1}+ GA_3 @ 500 ppm	11.75	65.01	21.31	241.06
T_8 – Coirpith compost 5 t ha^{-1}+ GA_3 @ 500 ppm	15.06	61.45	18.25	222.25
T_9 – Coirpith compost 10 t ha^{-1}+ GA_3 @ 500 ppm	10.44	65.20	22.34	245.13
T_{10} - Control	20.69	53.61	11.31	187.57
S.ED	0.64	0.57	0.47	3.05
CD (p=0.05)	1.28	1.15	0.94	6.11

Table 2. Influence of organic nutrients and Gibberllic acid on flowering and quality parameters in English cape Lilly (*crinum* spp)

Treatments	Days taken for spike emergence	Days taken for first floret open	Spike length (cm)	Flower length (cm)	Vase life (days)
T_1 – Vermicompost 2 t ha^{-1}+ GA_3 @ 500 ppm	35.19	41.58	48.41	11.34	9.49
T_2 – Vermicompost 2.5 t ha^{-1}+ GA_3 @ 500 ppm	29.54	35.99	54.80	12.48	11.42
T_3 – Vermicompost 3 t ha^{-1}+ GA_3 @ 500 ppm	28.93	35.37	55.50	12.58	11.62
T_4- Farmyard manure 10 t ha^{-1}+ GA_3 @ 500 ppm	32.70	38.49	51.16	12.22	10.58
T_5 - Farmyard manure 12.5 t ha^{-1}+ GA_3 @ 500 ppm	30.20	36.62	54.09	12.42	11.21
T_6 - Farmyard manure 15 t ha^{-1}+ GA_3 @ 500 ppm	27.69	32.36	57.28	12.88	12.59
T_7 – Coirpith compost 3 t ha^{-1}+ GA_3 @ 500 ppm	33.95	40.35	49.84	11.48	9.93
T_8 – Coirpith compost 5 t ha^{-1}+ GA_3 @ 500 ppm	31.45	37.86	52.67	12.28	10.78
T_9 – Coirpith compost 10 t ha^{-1}+ GA_3 @ 500 ppm	28.46	34.14	56.35	12.69	12.02
T_{10} - Control	37.02	43.43	46.28	11.15	8.88
S.ED	0.62	0.59	0.71	0.05	0.21
CD (p= 0.05)	1.24	1.19	1.42	0.11	0.42

Among this application of organic nutrients plays an important role in determining the yield per unit area. Hence due attention has to be to determine the optimum dose of organic manure enhances the growth and quality of English cape lily. Application of this farmyard manure either alone or in combination with growth regulator goes a long way in influencing in the productivity and as well as the quality of the flowers in bulbous crop by reducing the bulk density and particle density and increased the porosity contributed to the enhanced water holding capacity of the soil (Lal singh *et al.,* 2015).The present results could also be due to enhanced photosynthesis augmented by increase in growth parameters due to growth regulator application particularly GA_3 as reported by Jinesh Patel *et al.,* (2012). Increase in growth parameters due to foliar application of GA_3 may be due to the fact that Gibberellic acid increases cell division and cell elongation in plants resulting in more number of cells and increased cell length which ultimately increases the plant growth. Similarly, a significant increases in the vegetative characters with application of GA_3 was also reported by AL-Khassa Wreh *et al*., (2006) in Black Iris. In the present study application of GA_3 has quickly encouraged the emergence of spike for earlier. This might be attributed to the enhanced vegetative growth in early phase attributed by exogenous application of GA_3 which would have favored the increased photo synthesis and CO_2 fixation. Further, it would have favored convenience of factors influencing floral initiation *i.e*., carbohydrate pathway and photo periodic pathway with GA_3 pathway. Increase in flower and quality parameters observed due the application of GA_3 @ 500 ppm along with Farmyard manure in the present study is in close agreement with the findings of Mandloi, *et al* (2008) in onion, and Neha Chopde *et al.,* (2012) in Gladiolus.

Farmyard manure @ 15 t ha^{-1} and GA_3 @ 500 ppm along with was found to be beneficial in improving the growth and performance of English cape lily (*Crinum spp.*).

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