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ORIGINAL ARTICLE **OPEN ACCESS**

Influence of Two Different Protected Structures on growth and Flowering of Asiatic Lily Cv. Pollyanna

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ABSTRACT
An experiment was conducted in naturally ventilated polyhouse (T_1) and 25% shadenet (T_2) conditions at Horticultural Experimental Field, Department of Horticulture, Sam Higginbottom University of Agriculture, Technology and Sciences, during 2014-15 and 2015-16 to study the performance of Asiatic lily cv. Pollyanna under different protected structures. The experiment was laid out in Randomized Block Design with two treatments replicated 5 times. The study indicated the effect of temperature, humidity and light under protected as well as open field conditions on the performance of plant growth and floral characters. The various growth parameters likeplant height (50.7cm), leaf area (17.84cm^2) and plant spread (19cm) were recorded to be highest under shade net conditions whereas the floral parameters like early bud emergence (41.6days), early flower opening (33.6days), number of buds (4.4), flower diameter (133.38mm) and vase life (13.9days) were observed under poly house conditions while maximum stem length (50.7cm) was observed under shadenet conditions.
***Keywords**: Asiatic lily, growth, flowering, protected structures*

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INTRODUCTION

In the language of flowers, lily is the symbol of purity and innocence. Today, it is one of the most significant flowers grown by the cut flower industry. Due to its size, beauty and longevity *Lilium* is one of the ten most superior cutflowers in the world [9].As a cut flower, lily is now the fourth most important crop in the Netherlands [1].Due to their large and attractive flowers having capacity to rehydrate after a long transportation, popularity of *Lilium* is gaining fast in our country. The cultivars of genus *Lilium* are highly appreciated by the horticulturists for their outstanding range of colour, fragrance and adaptability to several environmental conditions [2]. Agroclimatic conditions of the plains of Uttar Pradesh during winter months are favourable for this flower crop, yet its commercial cultivation has not yet been started by the flower growers due to lack of knowledge about its production technology and unavailability of quality planting materials.

Plant environment affects growth, development and productivity of crops, temperature and light being the most crucial factors. Crop yield have been reported to depend on the responses of plants to environmental influences [3], for example, temperature has considerable influence on crop timing and yield [6] and light is primary determinant of crop growth. Throughout lily forcing, temperature has the greatest influence on the rate of growth and development [8].High temperature enhances development and increase not only initiation of buds, flowers and fruits but also their abortion due to increasing demand for assimilates [4].Light changes not only affects plant morphology, physiology and microstructure but also has an important impact on production. Increasing light intensity increases photosynthesis, which increases the rate of flower development and the number of flowers formed, reduces bud abortion and enhances the total flower potential [10]. Thus an experiment was conducted to assess the suitable growing environment of protected structures for Asiatic lily.

MATERIALS AND METHODS

The present experiment entitled "**Influence of two different protected structures on growth and flowering of Asiatic lily cv. Pollyanna"** was conducted at Horticultural Experimental Field, Department of Horticulture, Sam Higginbottom University of Agriculture, Technology and Sciences, during 2014-15and 2015-16. The study was laid out as Randomized Block Design with 2 different protected structures (Polyhouse T_1/Shadenet T_2) which were replicated 5 times. Twenty five number of plants per replications were used.Weeds and stubble were removed and the landwas brought to a fine tilth and raised beds were prepared in shadenet and polyhouse. The bulbs were planted at a depth of 6-8cm. The experimental site was kept weed free by periodic hand weeding. Irrigations were given as and when required, during crop growth period. Timely observations related to growth and flowering parameters was recorded. Data was recorded on plant height(cm), leaf area(cm^2), plant spread(cm), stem girth(mm),days to bud emergence, days to flower opening, number of buds, stem length(cm), flower diameter(mm) and vase life(days). Thesedata were subjected to analysis of variance technique (ANOVA).

RESULTS AND DISCUSSION

Growth parameters

Data on growth characters (Table 1) showed that three different growing conditions affected plant height, leaf area, plant spread, and stem girth. Maximum plant height (50.7cm), maximum leaf area (17.84cm^2), maximum plant spread (19.0cm) and was recorded under Shadenet (T_2)as compared to Polyhouse (T_1)conditions.This may be due to low light intensity which results in taller plants, change in leaf morphology, wherein plants grown under shade conditions develop large thin leaves with lesser stomata to compensate for the reduction in light intensity by increasing the surface area for the process of photosynthesis, horizontal leaf orientation for better light interception, enhanced photosynthesis and respiration due to the favorable micro-climatic conditions in the shadenet house. Whereas maximum stem girth (13.77mm) was found in polyhouse which may be attributed to higher assimilation of photosynthates in plants grown under polyhouse conditions coupled with lesser plant height which resulted in increase in the girth of stem.This might be due to a modification of climatic condition throughout the crop growth period coupled with better assimilation of nutrients.

Floral parameters

Data on floral characters **(Table 2)**revealed that minimum days taken for bud emergence was observed in polyhouse T_1(41.6 days) and maximum days was found to be in shadenet T_2(54.8 days) and similarly minimum days taken to flower opening was observed in polyhouse T_1 (33.6 days) and maximum was found to be in shadenet T_2 (41.7 days). This might be due to accumulation of photosynthates which triggered early initiation of flowers.The early bud initiation was observed during high temperatures, which promoted quicker transition from the vegetative state to the reproductive state. Polyhouse climate influenced the crops to early bud emergence and flower opening earlier than open field and shade net due to the advancement of required heat unit or thermal time of the crops which were grown inside the polyhouse. Maximum number of buds was found to be in polyhouse T_1 (4.4) and minimum number of buds was observed in shade net T_3 (1.4). This might be due to favourable climatic conditions coupled with faster growth and sufficient accumulation of photosynthates inside the polyhouse as compared toshadenet where low light intensity is insufficient to trigger bud formation and development.However, maximum stem length (50.7cm)was observed in shadenet which may be attributed to the fact that plants grown under shade tend be taller to compensate for reduction in light intensity. Similarly, maximum flower diameter (133.38mm) and vase life (13.9days) were observed in polyhouse T_1 followed by shadenet T_2. This may be due to better light and temperature conditions inside the polyhouse coupled with leaf area which enabled the accumulation of more amount of photosynthates thus, resulting in more flower diameter and better quality flower.

Table 1. Influence of different growing environment conditions on growth parameters of Asiatic lily cv. Pollyanna

Treatment	Plant height(cm)	Leaf Area(cm^2)	Plant spread(cm)	Stem girth(mm)
Polyhouse (T_1)	42.6	14.55	12.6	13.77
Shadenet (T_2)	50.7	17.84	19.0	11.35
CV	0.804	3.930	4.566	3.362
CD (5%)	0.677	1.148	1.298	0.761

Table 2. Influence of different growing environment conditions on floral parameters of Asiatic lily cv. Pollyanna

Treatment	Days to bud emergence	Days to flower opening	Number of buds	Stem length (cm)	Flower diameter (mm)	Vase life (days)
Polyhouse (T_1)	41.6	33.6	4.4	46.4	133.38	13.9
Shadenet (T_2)	54.8	41.7	1.4	50.7	117.70	8.6
CV	0.922	0.852	14.991	1.712	0.716	6.440
CD(5%)	0.801	0.578	0.784	1.498	1.620	1.305

REFERENCES

1. Anonymous (2011). VBN Statistiekboek (2011), 359 pp.
2. Bahr, L.R. and Compton, M.E. (2004). Competence for *in vitro*bulb regeneration among eight *Lilium* genotypes. *Hort Sci.,*39 (1) : 127-129
3. Ellis, R.H., Hadley, P., Roberts E.H. and Summerfield, R.J. 1990. Quantitative relations between temperature and crop development and growth. In: Jackson MT, FordLloyd BV, Parry ML (Eds)*Climatic change and plant genetic resources*, Belhaven Press, London, pp 85-115
4. Marcelis, L.F.M. and de Koning, A.N.M. (1995). Biomass partitioning in plants. In: Bakkar, JC, Bot GPA, Challa H, Van de BraakedsNJ (Eds) *Greenhouse climate control: An integrated approach,* Wageningen Pers, The Netherlands, pp 84-92
5. Mohanty, C.R., Mohanty, A., Das, A.B. and Kar, D.S. (2011). Comparative performance of some rose varieties under open and protected environment, *Asian J. Hort*., 6 (2) : 288-293
6. Pearson, S. (1992). Modelling the effect of temperature on growth and development of horticultural crops. Ph.D. thesis, Reading University, 24 pp
7. Reddy, M.T., Ismail, S. and Reddy, Y.N. (1999). Shade and allelopathic effects of ber on growth, productivity and quality of radish (*Raphanus sativus* L.) under pot culture. South Indian Horticult. 47:77-80.
8. Riviere, S., 1978. Influence of the temperature on the flowering of the white lily *Lilium candidum.*Canadian Journal of Botany 56:110-120.
9. Thakur, R., Sood, A., Nagar, P. K., Pandey, S., Sobti, R.C. andAhuja, P.S. (2005). Regulation of growth of*Lilium* plantlets inliquid medium by application of paclobutrazol or ancymidolfor its amenability in a bioreactor system: growth parameters.*Plant Cell Rep.,* 25 : 382-391
10. Wilkins, H.F.and J.M. Dole, (1997). The physiology of flowering in *Lilium.* Acta Horticulturae 430: 183-188

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