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Studies on the performance of liliium varieties under polyhouse

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Abstract

The experiment was conducted in the Precision Farming Development Centre, Department of Horticulture, CCS HAU, Hisar. Lillium is an important flower crop of commercial importance, which grows successfully under greenhouse conditions. In recent past, some area has come under liliium cultivation in different parts of Haryana. However there is a lack of complete package of practices for its cultivation under protected conditions. Therefore the studies of performance of different varieties has been undertaken at Hisar conditions. Nine varieties of Liliium (Brindisi, Litouwen, Pavia, Sulpice, Tresor, Eyeliner, Indian Diamond, Yellow Diamond and Indian summerset) were planted under the spacing 30x30 cm. The maximum plant height (108.20 cm) was found in var. Indian Diamond which was at par with var. Eyeliner (104.60 cm). Maximum no. of leaves (89.80) were found in var. sulpice and maximum stem diameter was observed in Var. Indian Summerset (8.16). Maximum buds was observed in variety Pavia (5.70), whereas; early flowering was observed in var. yellow Diamond (69.20 days). Maximum flower diameter (19.30 cm.) was observed in var. Indian summerset. Performance of all the varieties was good for cultivation under protected conditions.

Keywords: liliium, Varietal evaluation, polyhouse, flower Dia

Introduction

Among various flowers grown commercially, liliium is one of the horticulturally most important genera for cut flower and pot plant production. The genus liliium belongs to the family liliaceae. Liliiums are one of the most beautiful and popular ornamental bulbous plants. The appearance, beauty and color of the blooms are spectacular and very attractive. The genus Liliium of the family liliaceae comprises more than 80 speceis and these are divided into seven sections (Comber, 1949) [3]. In the language of flowers, the lily is the symbol of purity and innocence. Liliium deserves to be called the aristocrat of the plant world. The cultivars of genus *Lilium* are highly appreciated by the horticulturists for their outstanding range of colour, fragrance and adaptability to several environmental conditions (Bahr and Compton, 2004) [1]. Lilies can be used for informal planting in grassland or among orchard trees, along crocuses, bluebells and tulip to create flower meadows (Beck, 2010) [3]. The popularity of these hybrids, especially Asiatic and oriental types is increasing both as cut flower and pot plant (Lian *et al.*, 2003) [8]. It has been observed that Asiatic lily varieties/hybrids grown as garden plants by some amateurs in Hisar and other urban areas of the state are coming up well with a wide range of size, shape and colour. Although the agro climatic condition of the state is quite favourable for this flower crop, 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. Among several factors influencing growth, yield and quality of flowers, including liliium improved varieties / hybrids play significant roles which need proper evaluation for their performance under local agro climatic condition. Therefore, proper varietal evolution for the location specific has become essential. Hence, present investigation was conducted to assess the performance of Nine genotypes of liliium for their growth, flowering and bulb production characters at Hisar condition.

Materials and Methods

The experiment was carried out during the winter seasons at the Department of Horticulture, College of Agriculture, CCS Haryana Agricultural University, Hisar. Bulbs of nine liliium hybrid varieties *viz.*, Brindisi, Litouwen, Pavia, Sulpice, Tresor, Eyeliner, Indian Diamond, Yellow Diamond and Indian summerset were selected for the experiment. The bulbs were planted 30x30 cm apart on raised beds of one meter wide. The experiment was laid out in completely randomized block design. All the cultural practices, were followed and data were recorded time to time for six growth and floral parameters *viz.*, plant height (cm), No. of

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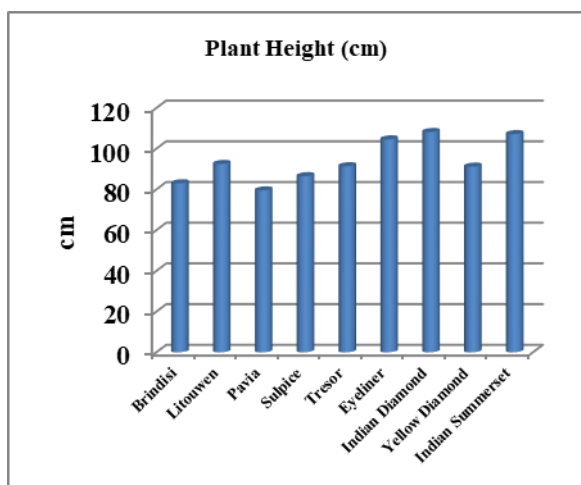
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Leaves, No. of Buds, Days taken to bud opening, Flower dia (cm) and Stem dia (mm) & data were subject to analysis of variance.

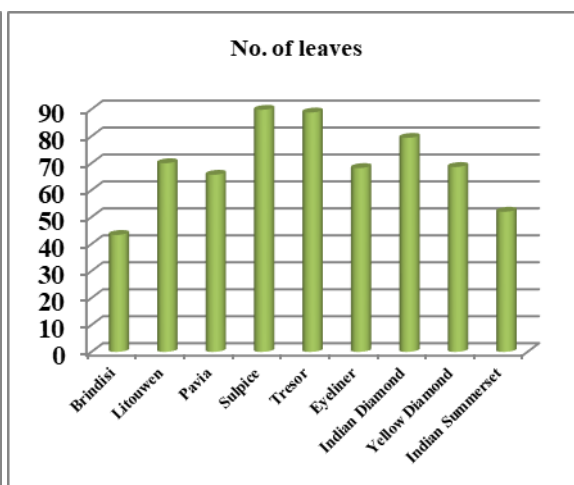
Results and Discussions

The plant height (cm) differed significantly among the different cultivars. Similar trend in results with “Georgia” and “Georgia Tetra” cultivars of *Lilium* have also been recorded by Wilfret and Raulston (1971) [13]. The data presented in graph 1 revealed that the maximum plant height (108.20cm) was recorded in Indian Diamond which differed significantly from other varieties. It was followed by Indian Summerset (107.20 cm) which was at par with Eyeliner (104.60cm). On the other hand the minimum was recorded with Brindisi (83.00 cm). Similar variation in plant height of different varieties of *Lilium* was also reported by Sindhu and Singh (2012) [11] under northern plains. Similarly number of leaves per plant was maximum (89.80) in var. Sulpice followed by var. Tresor (88.80) respectively. On the other hand the minimum (43.40) was recorded in var. Brindisi Similar

variation in the vegetative parameters of Asiatic lily was also reported by earlier workers (Pandey *et al.* 2008) [10]. Variety Sulpice recorded the maximum (8.42 mm) basal stem diameter which was closely followed by var. Indian summerset with basal stem diameter of 8.16 mm without showing any significant variation from each other. The minimum (6.77 mm) was recorded in var. Yellow Diamond among all the varieties under trial. Thicker stems are preferred to have sturdiness of plant otherwise the weak and thin stems may lead to lodging of plants. Similar variation in the vegetative parameters of Asiatic *Lilium* was also reported by Dwibedi *et al.* (2002) [7]; Pandey *et al.* (2008) [10] and Deka *et al.* (2010) [5]. Difference in vegetative growth characters of different cultivars may be due to varied growth rate and their genetic make ups as a result, variation in phenotypic expression are expected to occur. Similar results with respect to vegetative characters were also observed by Mishra (1997) [9]. The difference in various parameters among the cultivars may be due to different genetic makeup of cultivars (Barik, 2013) [2].



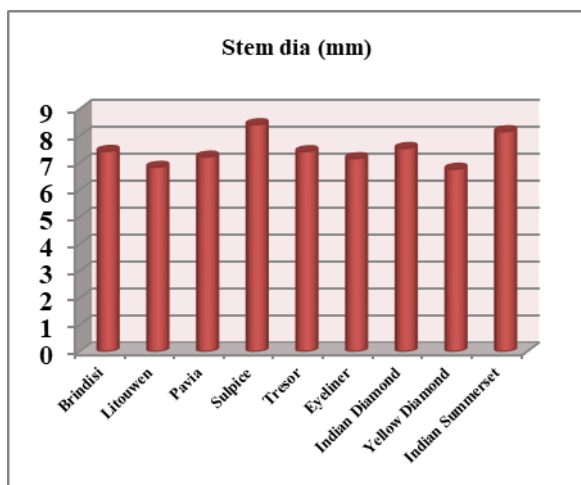
Graph 1: Plant Height



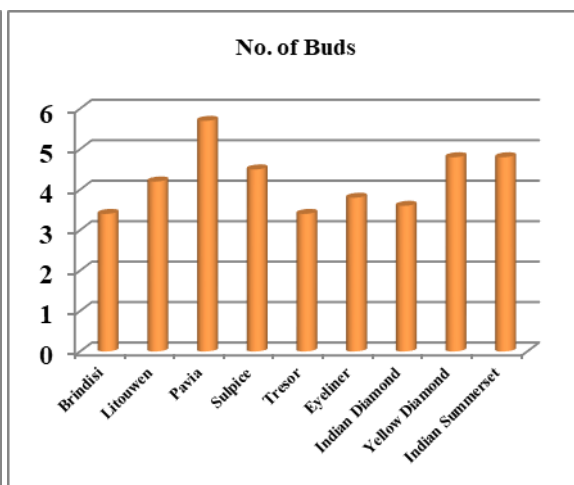
Graph 2: No. of leaves

The perusal of data on flowering characters (Graph 2) indicates that Number of flower buds per shoot is an important character which decides the cost of the flowering shoot. Generally more flower buds per shoot are preferred. In the present study performance of var. Pavia was better which

produced maximum number flower buds per shoot (5.70). It was followed by var. Yellow Diamond and Indian Summerset (4.8) and var. Sulpice (4.50). On the other hand the minimum (3.40) was recorded in var. Brindisi.



Graph 3: Stem Dia (cm)

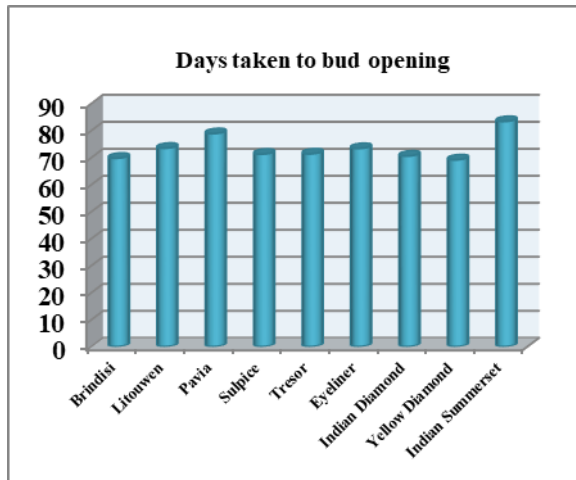


Graph 4: No. of Buds

Data recorded on days taken for first flower opening from planting and from appearance of flower bud revealed that var.

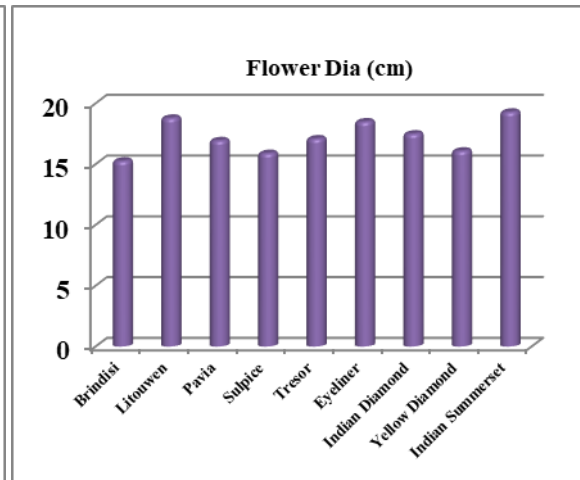
Yellow Diamond was the earliest to produce flower bud opening which took 69.20 days and was at par with var.

Brindisi where the same was observed in 69.80 days. On the other hand significantly maximum number of days (83.40 days) were taken by Indian Summerset followed by var. Pavia (78.90 days). Findings of the present study are in close agreement with Dhiman (2003) who observed significant variation among *Lilium* hybrids with respect to days to visible



Graph 5: Days taken to bud opening

bud formation under Kullu condition. The variation in number of days required for first bud opening was primarily due to the different genetic constitution of various cultivars and prevailing environmental conditions during the period of crop growth.



Graph 6: Flower Dia (cm)

Similar variation among the cultivars for days to first flowering was also reported by Sindhu and Singh (2012)^[11] in *Lilium*. So far as the width and length of flower was concerned, var. Indian Summerset recorded the maximum flower Dia (19.30cm) which differed significantly from the others. It was followed by var. Litouwen with 18.80 cm. respectively. The minimum was observed in var. Brindisi which recorded a value of 15.27cm. It may be concluded that variation in diameter of flower mainly due to the genetic makeup which might have been further modified by the environmental condition prevailing during the time of experiment.

Conclusion

It is concluded that the variation in cultivars may be due to genetic and environmental interaction. Among evaluated cultivars, performance of plants in respect of several parameters was found better under polyhouse condition. The selected cultivars can be used for cut flower production under Hisar condition with proper management practices.

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