

## Full Length Research Article

# GROWTH AND YIELD PARAMETERS AS INFLUENCED BY TUBERSIZE IN GLORY LILY (*GLORIOSA SUPERBA* L.)

\*Muruganandam, C.

Department of Horticulture, Faculty of Agriculture, Annamalai University Tamilnadu, India-608 002

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Glory lily (*Gloriosa superba* L.) is one of the important medicinal crops which has got great demand in pharmaceutical industries. The medicinal value of glory lily is commendable due to the presence of alkaloids. Recently, a new alkaloid namely 1-2 Didemethyl colchicine has been isolated from seeds. The crop is propagated through seed and tubers. When the tubers are used there is a wide variation in size and weight, and ultimately reflects on growth and yield of the crop. Hence a study was conducted in the Department of Horticulture, Faculty of Agriculture, Annamalai University, Tamilnadu, India during (June 2008 – December 2008) to find out an optimum seed tuber size to enhance growth and yield in glory lily. The experiment was conducted in a Randomized Block Design in four replications with five different sizes and weight of tubers ranging from less than 30g (T<sub>0</sub>), 31-50g (T<sub>2</sub>), 51-70g (T<sub>3</sub>), 71-90g (T<sub>4</sub>), and 91-110g (T<sub>5</sub>). The tubers of various sizes as per the treatments were planted in the field and required cultural practices were adopted of the crop as per the recommendation. The growth and yield parameters were recorded and subjected to statistical analysis. The results revealed that the plant height, stem girth, number of primary and secondary branches, number of flowers, number of pods and number of seeds per pod were recorded the highest in the tuber size of 51-70g (T<sub>3</sub>) followed by the tuber size of 31-50g (T<sub>2</sub>).

**Key words:** Glory lily, Seed tubers, Sprouting percentage, Pod characters, Seed yield.

## INTRODUCTION

Glory lily (*Gloriosa superba* L.) is an important medicinal crop belongs to the family Liliaceae. The entire plant is valued for its medicinal properties. The drug obtained from tubers and seeds are used as purgative. Leaf juice is employed to kill certain parasitic insects. The medicinal properties of the drug are due to the presence of alkaloids, chiefly 'colchicine' and 'gloriosine'. Colchicine extracted from the tubers and seeds is used in the treatment of 'gout' and rheumatism. Besides, colchicine is frequently used to induce polyploidy in crop plants. The crop is propagated through seeds and tubers. Since, the seedlings take longer time for flowering and yield, the crop for commercial purposes is raised only through tubers. The tubers exhibit wide variation in their weight and size. The plants raised from larger tubers generally grow vigorously with production of more flowers and pods when compared to the plants from very small tubers which sometimes even fail to flower during the first year (Farooqi and Sreeramam 2001). Non-availability of sufficient quantity of large tubers also poses problem. The commercial cultivation of this crop has been very recent and hence no systematic efforts have been made to understand the relationship between the size of the tuber and its effect on vegetative growth, branching pattern, flowering and seed yield in glory lily. In this context, an investigation was undertaken to standardize the economic size of tubers for propagation that would result in enhanced growth and yield.

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\*Corresponding author: Muruganandam, C.

## MATERIALS AND METHODS

The experiment was conducted in the Department of Horticulture, Faculty of Agriculture, Annamalai University during July 2008 to December, 2008. The experiment was laid out in a Randomized block design with four replications and with five treatments. The treatments include five size grades of tubers based on tuber weight viz., T<sub>1</sub> (less than 30g), T<sub>2</sub> (31-50g), T<sub>3</sub> (51-70g), T<sub>4</sub> (71-90g) and T<sub>5</sub> (91-110 g). Healthy and disease free tubers were selected based on the treatment and were planted at a spacing of 60cm \* 45cm between rows and plants. The plot size was 1.8 m x 2.25 m (4.05 m<sup>2</sup>) accommodating 15 plants per plot. The cultural operations were adopted following the recommended practices (Anon., 2004). Observations on growth and yield parameters were recorded and subjected to statistical analysis as per procedures outlined by Panse and Sukhatme (1978). Whenever the treatment effects were significant, critical difference (CD) at 5 per cent probability level was computed for better comparison of treatments.

## RESULTS AND DISCUSSION

The data presented in Table-1 showed a significant differences due to various treatments on growth and yield parameters in glory lily. Among the various treatments that tested, seed tubers with a weight of 51-70 g (T<sub>3</sub>) recorded maximum plant height (253.60 cm) and stem girth (6.92cm) followed by T<sub>2</sub> (31-50 g) with a plant height of 233.33 cm and stem girth of 6.00cm respectively, whereas T<sub>1</sub> (<30 g) recorded the least

plant height (181.00cm) and stem girth (4.25cm) The number of primary and secondary branches also showed significant differences which were maximum in Tj (51-70 g) followed by T<sub>2</sub> (31-50 g) as against the least in TI (<30 g) Similar results on increased growth parameters on maximum tuber size were reported by many authors. Carow (1976) reported in *G. rothschildiana*, that tuber weight influenced the plant height and other growth attributes. Pavithra (1989) found a tuber weight of 71-85 g as optimum which produced the tallest plants in *Gloriosa superba*. The results reported by Mattos (1984) in gladiolus are in agreement with the findings of the present study. The tuber weight of 51-70 g (T<sub>3</sub>) produced highest number of flowers (42.17 plant), as against the least number of flowers (22.38 plant) was produced in TI (<30 g). In *G. rothschildiana*, Krause (1981) and Mattos (1984) observed that bigger seed tubers were responsible in producing more number of flowers per plant. Pavithra (1989) in *G. superba* reported that a tuber weight of 71-85 g produced higher number of flowers. More number of pods (35.54) was produced in the plants that were raised from tubers with a weight range of 51-70g (T<sub>3</sub>) when compared to the plants raised from seed tuber weight of less than 30 g (Ti), recorded a yield of 22.80 pods. In the present study the seed yield per pod showed similar trend with 35.54 in Ta (51-70 g), followed by T<sub>2</sub> (31-50 g) with 32.59. These results may be attributed to greater availability of stored food materials in large sized tubers resulting in higher initial growth, accelerated flowering and yield. Carow (1976) and Krause (1981) showed an increase in growth attributes and yield with increase in seed tuber weight in *G. rothschildiana*. In *G. superba*, Pavithra (1989) observed an increase in pod and yield parameters upto a seed tuber weight of 71-85 g. In gladiolus, the inflorescence and flower quality was high when corm of large size was used (Mattos, 1984).

The study has conclusively showed the superiority of tubers weighing 51 -70 g as ideal planting material in glory lily in enhancing growth and yield parameters.

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