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Research Paper

Influence of fertigation levels and drip irrigation on flower quality of bird-of-paradise (*Strelitzia reginae* Ait.)

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ABSTRACT

Bird-of-Paradise is indigenous to South Africa. The genus *Strelitzia* belongs to the family Strelitziaceae, the species *Strelitzia reginae* is commonly known as bird-of-paradise, the name comes from the remarkably shaped and coloured flower cluster, like the crested head of a bird. An experiment was conducted to know the effect of different levels of fertigation and irrigation through drip on quality flower production of bird-of-paradise during 2008-09 at Precision Farming Development Center, UAS, GKVK, Bangalore. 80, 100 and 120 per cent recommended dose of fertilizers (16:11:6g NPK/plant/month) were provided through fertigation in splits at monthly interval along with 8 and 12 litres of water per day per plant for 12 months. Higher fertigation level T_6 {120 per cent recommended dose of fertilizer + 12 litres of water/day/plant} recorded maximum stalk length (100.30 cm), stalk diameters (13.19 mm), inflorescence weight (148.22 g), length of bracts (19.80 cm), length of sepals (12.29 cm) and length of petals (11.79 cm) as compared to control.

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Key words : Bird-of-Paradise, Inflorescence, Strelitziaceae, Drip irrigation and Fertigation

INTRODUCTION

Bird-of-Paradise (*Strelitzia reginae* Ait.) is an evergreen perennial herbaceous plant, grown in the regions having moderate subtropical climate. The brilliant colours and unusual appearance of the flowers have made it exceptionally popular as cut flower. Therefore, the crop is cultivated in many parts of the world in order to produce cut flowers for both domestic and international markets. The major producing countries of bird-of-paradise on commercial scale are USA, Israel and South Africa. Bird-of-Paradise occupies a pride of place in the garden and is an important choice for landscaping. In the background of an herbaceous border, in front of a shrubbery or along the side of a tank or lily pool, a highly delightful effect is developed when it is in flowering. It can also be grown in pots and boxes.

Bird-of-Paradise is indigenous to South Africa. The species *Strelitzia reginae* is commonly known as bird-of-paradise, the name comes from the remarkably shaped and coloured flower cluster, like the crested head of a bird. The genus *Strelitzia* belongs to the family Strelitziaceae. The plants are rhizomatous, sometimes with erect woody stem. The leaves are large, long petioled, scape is terminal or in the upper axils, short, exerted from the sheathes of the leaves. The bracts are large spathe like, boat shaped, acuminated and solitary at the end of the scape, slightly distant, perianth long exerted. The sepals are free, long and carinate. The petals look dissimilar. The stamens are five in number and the ovary is three celled with many seeds. The morphology of inflorescence, leaves, stem, root system, fruit and seeds of this species have been described and illustrated by Szendel *et al.* (1976).

The genus *Strelitzia* includes about five species. They are *S. nugusta, S. reginae, S. kewensis, S. nicoli and S. candida. Strelitzia reginae* is very popular flowering species growing upto a height of 90 cm, the leaf stalk is about 45 cm long with the same length of leaf blade. The flowers with orange sepals and purple petals are very brilliant, emerging from the purplish spathes on a stem

about 90 cm long.

Fertigation permits application of various fertilized formulations directly at the site of concentration of active roots and it is thus reported to improve the efficiency of nutrients and reduce their requirements besides increasing the flower quality, which is at most important in exporting the flowers for international market.

MATERIALS AND METHODS

The field experiment was laid out in a RCBD design with three replications during 2008-2009 at the Precision Farming Development Centre (PFDC), Division of Horticulture, Gandhi Krishi Vignana Kendra, University of Agricultural Sciences, and Bangalore-560 065. The experiment was conducted on one-year-old planted bird-of-paradise plants to know the effects of fertigation on growth and yield. The plants were planted at the spacing of 1.5m X 1.5m; from the plot 42 well-developed plants were selected for the experiment. 80, 100 and 120 per cent recommended dose of fertilizers (16:11:6g NPK/plant/month) were provided through fertigation in splits at monthly interval along with 8 and 12 litres of water per day per plant for 12 months. Observations such as stalk length, stalk diameters, inflorescence weight, length of bracts, length of sepals and length of petals were recorded

RESULTS AND DISCUSSION

The data (mean of three replication) on effect of different levels of fertigation on stalk length, stalk diameters, inflorescence weight, length of bracts, length of sepals and length of petals were recorded. Statistically analyzed data are presented in Table 1.

Increase in level of fertigation and drip irrigation increased stalk length. The maximum stalk length (100.30 cm) was recorded in T_6 level where as minimum stalk length (51.63 cm) was recorded in control (T_7). T_6 level of treatment recorded maximum inflorescences diameter (13.19 mm) while minimum inflorescence diameter (10.57 mm) was recorded in T_1 level of treatment. Maximum weight of inflorescence (148.22 g) was recorded in T_6 level of treatment where as minimum weight of inflorescence (73.92 g) was recorded in control (T_7). T_6 level of treatment recorded highest length of bracts (19.80 cm) which was at par with T_5 level (19.74 cm) and T_4 level of treatment (19.62 cm) while the lowest length of bracts (17.02 cm) was noticed in T_1 level of treatment. The highest sepals length (12.29 cm) was recorded in T_6 level of treatment followed by T_5 (12.14 cm) where as lowest length of sepals (9.33 cm) was recorded in T_1 level of treatment. In the treatment level T_6 highest length of petals (11.79 cm) was recorded while in the treatment level T_1 and control (T_7) lowest length of petals (8.24 cm)

Table 1 : Effect of fertigation and drip irrigation on stalk length, diameter of stalk, weight of inflorescence, length of bracts, sepals and petals of bird-of-paradise

Treatments	Stalk length (cm)	Diameter of stalk (mm)	Weight of inflorescence (g)	Length of bracts (cm)	Length of sepals (cm)	Length of petals (cm)
T_1 – 80 per cent of recommended dose + 8 litre of water per plant per day	68.73	10.57	76.03	17.02	9.33	8.24
T_2 – 80 per cent of recommended dose + 12 litre of water per plant per day	71.70	11.13	75.79	17.05	9.40	9.15
T_3 – 100 per cent of recommended dose + 8 litre of water per plant per day	74.79	11.28	94.11	17.76	10.86	10.25
T_4 – 100 per cent of recommended dose + 12 litre of water per plant per day	80.10	11.71	102.26	19.62	11.44	10.84
T_5 – 120 per cent of recommended dose + 8 litre of water per plant per day	89.11	12.39	137.90	19.74	12.14	11.29
T_6 – 120 per cent of recommended dose + 12 litre of water per plant per day	100.30	13.19	148.22	19.80	12.29	11.79
T_7 – control	51.63	11.41	73.92	17.38	9.59	8.24
F-value	*	*	*	*	*	*
S.E.±	1.55	0.20	1.91	0.27	0.19	0.12
C.D. (P=0.05)	4.80	0.63	5.90	0.83	0.60	0.37

* indicates significance of value at P=0.05

was recorded.

The quality characters like stalk length, diameter of stalk, weight of inflorescence, length of bracts, petals and sepals were statistically significant, influenced by higher level of fertigation and drip irrigation. Higher (T_6) level of fertigation and drip irrigation resulted in production of maximum stalk length, diameter of stalk and weight of inflorescence, length of bracts, petals and sepals than the other fertigation levels. This might be due to the higher nutrients availability at monthly interval and water to the plants daily has resulted in production of stronger and taller flower stalk with higher number of florets. Build up of sufficient photosynthates enabling in increasing the quality parameters these results are comparable with findings of Siraj Ali (1998) in bird-of-paradise, Bankar and Mukhophadhyaya (1990) and Sharma and Mohammad (2004) in tuberose

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