

GROWTH, DEVELOPMENT AND YIELD ATTRIBUTES IN ANTHURIUM PLANTS BY THE FOLIAR APPLICATION OF ORGANIC FERTILIZERS

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ABSTRACT

Anthurium ranks eleventh in the global flower trade and commands a respectable price both for its cut flower and whole plant. Anthuriums are gaining popularity due to higher returns per unit area and their beautiful and attractive long lasting flowers. They have gained popularity as one of the most important commercial ornamental crop of the modern world. They are very popular with flower arrangers because of bold effect and lasting qualities of flowers. Plants require nutrients for their growth and development. These nutrients may be applied to the soil or they may be applied to the foliage of the plants. Nutrients applied to the foliage are generally absorbed more rapidly than when applied to the soil. When applied to the foliage, they are known as foliar sprays. Present study was carried out for finding the growth, development and yield attributes in anthurium plants by the foliar application of organic fertilizers. This experiment was conducted with eight different nutrients *viz.* Sea weed extract, Vermiwash, Compost, Bone meal, FYM, Panchakavya, Humic acid and control sprayed to anthurium plants as foliar application. The treatments were replicated thrice. The plants were maintained under 75 per cent shade net and with a growing medium mixture of coir pith + coconut husk. Among the different treatments, foliar spray of Humic acid resulted with maximum plant height, plant spread, number of flowers per plant, flower stalk length, spathe length and spathe breadth. The number of days taken for flower bud appearance was also faster in this treatment.

Key words: Organic nutrients, Anthurium.

INTRODUCTION

Anthuriums are tropical plants grown for their showy cut flowers and attractive foliage. It has gained the importance as major cut flower and it makes best use of ready market for cut flowers with high returns both for its cut flower and whole plant. Anthurium is a genus of herbs often growing as epiphytes on other plants. Some are terrestrial. The leaves are often clustered and are variable in shape. The inflorescence bears small flowers which are perfect, containing male and female structures. Anthurium is a slow growing

perennial that requires shady, humid conditions as found in tropical forests. Plant nutrition is the chemical elements and compounds necessary for plant growth, plant metabolism and their external supply. Epstein (1972) defined two criteria for an element to be essential for plant growth, in its absence the plant is unable to complete a normal life cycle and that the element is part of some essential plant constituent or metabolite. The Anthurium plant possesses an underground rhizome with adventitious roots, with somewhat creeping habit of growth, using aerial roots for anchorage.

The productivity and quality of flowers are closely related to nutrient supplement. Nitrogen, phosphorus and potassium are the three important nutrients that play very important role in altering growth, yield and quality attributes (Abdussamed, 1999). A foliar nutrient is any liquid substance applied directly to the foliage of a growing plant for the purpose of delivering an essential nutrient in an immediately available form. The plant produces blooms throughout the year, one bloom emerging from the axil of every leaf. Flowers are usually harvested once a week at three quarters maturity. Even though Anthurium is grown by many planters, it is most important to obtain higher yield and quality of the flower. Therefore, the present work is carried out with a view to find the performance of organic fertilizers for enhancing the growth and flowering.

MATERIAL AND METHODS

The present study was carried out in Flora-tech floriculture unit at kottarakara, kollam Dist, kerala state, India during 2014- 2016. The experiment was conducted with eight organic fertilizers given to anthurium plants as foliar spray on 15 day intervals. The treatments with three replications were carried out in completely randomized design. The *Anthurium andreanum* cv. Tropical was used for the study with 8 different organic fertilizer treatments at a concentration of 4 % are given here, T₁ (Sea Weed Extract), T₂ (Vermiwash), T₃ (compost), T₄ (bone meal), T₅ (FYM), T₆ (Panchakavya), T₇ (humic acid) and T₈ (control). Plant height, plant spread, number of flowers per plant, flower stalk length, spathe length, spathe breadth and number of days taken for flower bud appearance were observed and recorded.

RESULTS AND DISCUSSION

The result shown significant influence in overall performances of Anthurium plants due to of organic fertilizers. Among the different organic fertilizers, the maximum plant height (62.01 cm), plant spread (85.18 cm), number of flowers per plant (10.38), flower stalk length (56.23 cm), spathe length (14.33 cm) and spathe breadth (14.68 cm) were recorded in T₇ (Humic Acid), this was followed by T₁ (SWE) with plant height of 60.31 cm, plant spread of 83.45 cm, 8.85 flowers per plant, flower stalk length of 54.97 cm, spathe length of 13.88 cm and 14.18 cm of spathe breadth. Days taken for flower bud initiation was also early in T₇ with 61.43 days, followed by T₁ with 66.18 days. The least plant height (45.45 cm), plant spread (67.06 cm), number of flowers per plant (5.83), flower stalk length(43.41 cm), spathe length(8.10 cm) and spathe breadth(8.05 cm)

were recorded in T₈ (control). Days taken for flower bud initiation were delayed in T₈, which took 98.86 days for bud appearance.

The increased results in the study may be due to appropriate shade of 75 percent and growing media comprising of coir pith and coconut husk along with foliar spray application of humic acid. According to Dufour and Gue`rin (2005) in *Anthurium* nutritional status affects yield and quality. According to Anand and Jawaharlal (2004) flowering behaviour of *Anthurium* plants has been drastically modified by the foliar spray of nutrients. Dufour and Gue`rin (2005) concluded that the plants grown on coir pith substrate and sprayed with HA gave high yield of good quality flowers in *Anthurium*. Nikbakht *et al.*, (2008) reported that application of 500 mg/l humic acid increased the number of flowers per plant. The highest value of flowering parameters such as number of flowers per plant, flower diameter, pedicel length, fresh weight and dry weight were recorded in 2% HA treatments with *Chrysanthemum* (Azza *et al.*, 2012). Nikbakht *et al.*, (2008) reported that application of 500 mg/l humic acid extended the vase life of harvested flowers in gerbera. Vaughan (1974) proposed that humic acids may primarily increase root growth by increasing cell elongation and root cell membrane permeability, therefore increased water uptake by increased plant roots. Humic acid could produce root systems with branching and number of fine roots, as a result nutrients uptake was increased by root surface (Rauthan and Schnitzer, 1981). Dhara and Gupta (1984) revealed that addition of 4% humic acid increased the organic carbon content from 0.16 to 2.3 per cent at 90 days of soil incubation. The cation exchange capacity of the polluted soil was improved by the application of FYM, peat and humic acid (Ram and Verloo, 1985). Humic acid enhanced uptake of metabolic ions and increase in cell permeability (Chen and Aviad, 1990). Humic acid has beneficial effects on nutrient uptake by plants and is particularly important for transportation and availability of micronutrients (Bohme and Thilua, 1997). Considering the results of the present investigation it could be concluded that the application of Humic Acid 4 % with 75 percent shade and growing media comprising of coir pith and coconut husk as the best for the growth and yield of *Anthurium andreanum* cv. Tropical.

Table 1. Growth and development in anthurium plants on growth characters by the foliar application of organic fertilizers

Treatments	Plant height	Plant spread	Number of leaves per plant	Number of flowers per plant	Fresh weight of plant (g/plant)	Flower stalk length
T ₁ - SWE	60.31	83.45	9.98	8.85	75.31	54.97
T ₂ - Vermiwash	54.67	77.50	8.63	7.65	51.66	50.72
T ₃ - Compost	56.37	79.23	7.34	8.02	46.32	51.97
T ₄ - Bone meal	55.45	75.06	8.04	7.83	40.93	47.41
T ₅ - FYM	60.01	83.18	9.63	8.22	68.98	56.23
T ₆ - Panchakavya	58.64	81.76	8.38	8.48	63.28	53.75
T ₇ - Humic acid	62.01	85.18	10.38	9.22	77.37	56.23
T ₇ - Control	45.45	67.06	4.03	5.83	52.18	43.41
SE (d)	0.68	0.79	0.17	0.15	2.51	0.58
CD (p=0.05)	1.51	1.58	0.32	0.32	5.18	1.11

Table 2. Growth and development in anthurium plants on the flowering characters by the foliar application of organic fertilizers

Treatments	Spathe length (cm)	Spathe breadth (cm)	Spadix length (cm)	Days taken for flower bud appearance	Number of days taken for flower opening	Flower longevity on plant (days)	Vase life of flowers (days)	Visual scoring
T ₁ - SWE	13.88	14.18	9.43	66.18	32.61	43.01	17.73	9.01
T ₂ - Vermiwash	12.42	12.57	7.82	79.59	34.56	41.94	16.54	8.18
T ₃ - Compost	12.87	13.07	7.26	74.84	37.52	37.18	16.28	8.68
T ₄ - Bone meal	12.10	13.05	6.69	83.86	40.01	36.91	15.47	7.93
T ₅ - FYM	13.33	14.68	8.66	66.43	35.61	40.99	16.37	8.29
T ₆ - Panchakavya	13.44	13.70	9.06	70.84	39.77	41.75	14.56	6.34
T ₇ - Humic acid	14.33	14.68	9.90	61.43	32.04	45.92	18.56	9.43
T ₇ - Control	8.10	8.05	5.90	98.86	45.91	18.67	10.72	4.08
SE (d)	0.19	0.24	0.20	-2.18	0.15	0.49	0.31	0.22
CD (p=0.05)	0.39	0.44	0.41	-4.33	0.32	0.96	0.59	0.46

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