Chapter - VI

Summary

Anthurium is one of the major cut flowers in the world. Anthurium ranks eleventh in the global flower trade and commands a respectable price for its cut flower, foliage and the whole plant. Anthuriums are gaining popularity due to higher returns per unit area and their beautiful and attractive long lasting flowers. Now-a-days, anthuriums are considered as one of the most important commercial ornamental crops of the modern world. They are very popular with flower arrangers because of bold effect and lasting qualities of flowers. Under normal conditions, flowers stay fresh without much deterioration for a period of about two weeks. Due to its long lasting nature and the increasing demand for export and domestic consumption, anthurium cultivation and its marketing proved itself to be lucrative business venture.

Eventhough anthurium is grown by many planters, there is very less scientific information on the requirement of proper shade, growing media, nutrition and growth regulators on the commercial anthurium cut flower production in India. The performance of anthurium variety is solely depended on the right amount of shade, appropriate growing media, proper nutrition and growth regulation which are of utmost importance for commercial cultivation. Hence, standardization of shade management, growing media, nutrients and growth regulators is essential to obtain higher yield, quality and for improving the vase life of the anthurium flowers. In light of the above facts, the present research work entitled “studies on
the effect of shade, media and nutrients on the production of anthurium cut flowers” was carried out in two experiments. The highlights of the results of the above two experiments are summarized hereunder.

6.1. **EXPERIMENT: I- EFFECT OF SHADE, GROWING MEDIA AND THEIR INTERACTION ON THE PRODUCTION OF Anthurium andreanum CV. TROPICAL**

1. In the first experiment, the growth, physiological, flowering, yield, quality and nutrient content significantly influenced the *per se* and interaction effects of different shade levels, growing media and their combination compared to control with Anthurium andreanum cv. Tropical.

2. Among the different shade levels used, 75 per cent shade (S₂) recorded the maximum values in growth and physiological characters of anthurium such as like plant height (44.83 cm), plant spread (67.00 cm²), number of leaves per plant (8.12), leaf area (392.97 cm²), chlorophyll ‘a’ content (2.28 mg/g), chlorophyll ‘b’ content (1.51 mg/g), total chlorophyll content (3.79 mg/g), number of suckers per plant (3.34), root length (28.49 cm), fresh weight of plant (60.45 g/plant) and dry matter production (6.44 g/plant), followed by 85 per cent shade (S₁).

3. Regarding the various shade levels used, the shade level 75 per cent (S₂) recorded the maximum values of flowering and quality characters such as the minimum number of days for flower bud appearance (106.89 days) and the minimum number of days taken for flower opening (30.33 days) with the highest values on number of flowers per plant (4.52), flower stalk length (38.63 cm), spathe length (8.59 cm), spathe breadth (8.77 cm), spadix length (5.29 cm),...
longevity of flower in the plants (40.11 days), vase life of flowers (8.45 days) and with a visual scoring of 7.63 grade as good, followed by 85 per cent shade (S1).

4 Among the different shade levels used, 75 per cent shade (S2) recorded the maximum values in plant nutrient content such as nitrogen content of 0.20 per cent, phosphorus content of 0.03 per cent and with a potassium content of 0.09 per cent of anthurium plants, followed by 85 per cent shade (S1).

5 From the different growing media used, the combination of coco peat + coconut husk at the ratio of 1:1 (M1) recorded the maximum values in growth and physiological characters like plant height (42.45 cm), plant spread (63.65 cm²), number of leaves per plant (7.76), leaf area (358.25 cm²), chlorophyll ‘a’ content (2.11 mg/g), chlorophyll ‘b’ content (1.40 mg/g), total chlorophyll content (3.51 mg/g), number of suckers per plant (3.04), root length (26.82 cm), fresh weight of plant (55.60 g/plant) and dry matter production (5.91 g/plant), followed by coco peat + brick pieces at the ratio of 1:1 (M2).

6 Regarding the growing media combination of coco peat + coconut husk at the ratio of 1:1, M1 recorded the maximum values in flowering and quality characters such as the minimum number of days for flower bud appearance (113.16 days) and the minimum number of days taken for flower opening (32.57 days) with the maximum values on number of flowers per plant (4.17), flower stalk length (35.89 cm), spathe length (8.08 cm), spathe breadth (8.24 cm), spadix length (4.96 cm), longevity of flower in the plants (37.82 days), vase life of flowers (7.97 days) and with a visual scoring range of 7.21 grade as good, followed by M2.
7. Among the different combination of growing media used, coco peat + coconut husk at the ratio of 1:1 (M₁) recorded the maximum values in plant nutrient contents such as nitrogen content of 0.19 per cent, phosphorus content of 0.03 per cent and with a potassium content of 0.08 per cent, followed by coco peat + brick pieces at the ratio of 1:1 (M₂).

8. In the interactions of shade and growing media, the plants grown under 75 per cent shade with a growing media combination of coco peat + coconut husk at the ratio of 1:1 (S₂ × M₁) recorded the maximum values in all the growth and physiological characters like plant height (48.82 cm), plant spread (72.55 cm²), number of leaves per plant (8.69), leaf area (454.56 cm²), chlorophyll ‘a’ content (2.58 mg/g), chlorophyll ‘b’ content (1.71 mg/g), total chlorophyll content (4.29 mg/g), number of suckers per plant (3.88), root length (31.32 cm), fresh weight of plant (68.98 g/plant) and dry matter production (7.36 g/plant), followed by 75% shade + coco peat & brick pieces at the ratio of 1:1 (S₂ × M₂).

9. The interactions of shade and growing media significantly influenced the plants grown under 75 per cent shade with a growing media combination of coco peat + coconut husk at the ratio of 1:1 (S₂ × M₁) which recorded the maximum value in all flowering and quality characters such number of flowers per plant (5.13), flower stalk length of 43.39 cm, spathe length (9.47 cm), spathe breadth (9.66 cm), spadix length of 5.85 cm, longevity of flower in the plants (43.98 days), vase life of flowers (9.26 days) and visual scoring range of very good (8.34 grade) with the minimum number of days for flower bud appearance (93.38 days) and the minimum number of days taken for flower opening (25.61 days), followed by 75% shade + coco peat & brick pieces at the ratio of 1:1 (S₂ × M₂).
10 The interaction effects of shade and growing media on anthurium plants grown under 75 per cent shade with growing media combination of coco peat + coconut husk at the ratio of 1:1 (S₂ × M₁) recorded the maximum value in plant nutrient contents such as nitrogen content of 0.23 per cent, phosphorus content of 0.04 per cent and with a potassium content of 0.11 per cent, followed by 75% shade + coco peat & brick pieces at the ratio of 1:1 (S₂ × M₂).

11 Based on the growth, physiological, flowering, yield, quality characters of anthurium plants and its nutrient contents in the experiment - I, it is concluded that *Anthurium andreanum* cv. Topical performed well in a treatment combination of 75 per cent shade level with a growing media combination of coco peat and coconut husk at 1:1 ratio (S₂ × M₁), followed by 75 % shade + Coco peat & brick pieces at the ratio of 1:1 (S₂ × M₂).

6.2. EXPERIMENT: II - EFFECT OF NUTRIENTS, GROWTH REGULATORS AND THEIR INTERACTION ON THE PRODUCTION OF *Anthurium andreanum* CV. TROPICAL.

1 In the second experiment, the growth, physiological, flowering, yield, quality characters and nutrient content of *Anthurium andreanum* cv. Tropical were significantly influenced the *per se* and interaction effects of nutrients and growth regulators under the fixed shade level of 75 per cent with growing media combination of coco peat + coconut husk at 1:1 ratio.

2 Among the different types of nutrients used, humic acid 3 per cent at fortnight intervals (N₃) recorded the maximum values in growth and physiological characters like plant height (60.81 cm), plant spread (84.14 cm²), number of leaves per plant (12.40), leaf area (603.72 cm²), chlorophyll ‘a’ content (3.83 mg/g),
chlorophyll ‘b’ content (2.98 mg/g), total chlorophyll content (6.81 mg/g),
number of suckers per plant (5.63), root length (39.94 cm), fresh weight of
plant (98.92 g/plant) and dry matter production (9.51 g/plant), followed by
panchagavya 3 % at fortnight intervals ($N_2$).

3 From the different types of nutrients used, humic acid 3 per cent at fortnight
intervals ($N_3$) recorded the maximum values in flowering and quality
characters such as number of flowers per plant (9.00), flower stalk length
(55.30 cm), spathe length (14.04 cm), spathe breadth (14.37 cm), spadix length
(8.22 cm), longevity of flower in the plants (58.64 days), vase life of flowers
(16.67 days) and a visual scoring range of excellent (9.29 grade) with the
minimum number of days for flower bud appearance (62.66 days) and the
minimum number of days taken for flower opening (16.81 days), followed by
panchagavya 3 per cent at fortnight intervals ($N_2$).

4 In the different types of nutrients used, humic acid 3 per cent at fortnight
intervals ($N_3$) recorded the maximum values in all plant nutrient contents such
as nitrogen content of 1.14 per cent, phosphorus content of 0.19 per cent and
with a potassium content of 0.86 per cent, followed by panchagavya 3 % at
fortnight intervals ($N_2$).

5 Among the growth regulator treatments applied, gibberellic acid ($G_1$) 750 ppm
at monthly intervals recorded the highest values in growth and physiological
characters like plant height (60.32 cm), plant spread (83.68 cm$^2$), number of
leaves per plant (12.28), leaf area (598.84 cm$^2$), chlorophyll ‘a’ content (3.79
mg/g), chlorophyll ‘b’ content (2.95 mg/g), total chlorophyll content (6.74 mg/g),
number of suckers per plant (5.57), root length (39.64 cm), fresh weight of plant (98.09 g/plant) and dry matter production (9.43 g/plant), followed by benzyladenine (G₃) 750 ppm at monthly intervals.

6 In the growth regulator treatments, gibberellic acid (G₁) 750 ppm at monthly intervals recorded the maximum values in flowering and quality characters such as number of flowers per plant (8.89), flower stalk length (54.94 cm), spathe length (13.91 cm), spathe breadth (14.23 cm), spadix length (8.13 cm), longevity of flower in the plants (58.11 days), vase life of flowers (16.49 days) and a visual scoring range of excellent (9.24 grade) with the minimum number of days for flower bud appearance (63.57 days) and the minimum number of days taken for flower opening (17.18 days), followed by benzyladenine (G₃) 750 ppm at monthly intervals.

7 Regarding the growth regulator treatments, gibberellic acid (G₁) 750 ppm at monthly intervals recorded the maximum values in plant nutrient contents such as nitrogen content of 1.12 per cent, phosphorus content of 0.19 per cent and with a potassium content of 0.83 per cent, followed by benzyladenine (G₃) 750 ppm at monthly intervals.

8 The results on the interaction effect of nutrients and growth regulators, humic acid 3 per cent at fortnight intervals and gibberellic acid 750 ppm at monthly intervals (N₃ × G₁) recorded the highest values in all the growth and physiological characters like plant height (66.11 cm), plant spread (89.56 cm²), number of leaves per plant (13.68), leaf area (656.36 cm²), chlorophyll ‘a’ content (4.27 mg/g), chlorophyll ‘b’ content (3.31 mg/g), total chlorophyll content (7.58 mg/g),
number of suckers per plant (6.29), root length (43.26 cm), fresh weight of plant (107.81 g/plant) and dry matter production (10.38 g/plant), followed by humic acid 3 per cent at fortnight intervals and benzyladenine 750 ppm at monthly intervals ($N_3 \times G_3$).

9 The results revealed that the interaction effect of the treatment combination of humic acid 3 % at fortnight intervals and gibberellic acid 750 ppm at monthly intervals ($N_3 \times G_1$) recorded the highest values in the flowering and quality characters such as number of flowers per plant (10.08), flower stalk length (59.35 cm), spathe length (15.38 cm), spathe breadth (15.84 cm), spadix length (9.18 cm), longevity of flower in the plants (64.27 days), vase life of flowers (18.54 days) and with a visual scoring range of excellent (9.81 grade) with the minimum number of days for flower bud appearance (55.36 days) and the minimum number of days taken for flower opening (13.81 days), followed by humic acid 3 % at fortnight intervals and benzyladenine 750 ppm at monthly intervals ($N_3 \times G_3$).

10 The results revealed that the interaction effect of the treatment combination of humic acid 3 % at fortnight intervals and gibberellic acid 750 ppm at monthly intervals ($N_3 \times G_1$) recorded the highest values in plant nutrient contents such as nitrogen content of 1.41 per cent, phosphorus content of 0.32 per cent and with a potassium content of 1.34 per cent, followed by humic acid 3 % at fortnight intervals and benzyladenine 750 ppm at monthly intervals ($N_3 \times G_3$).
Based on the performance of anthurium plants on growth, physiological, flowering, yield, quality attributes and the nutrient contents, it is concluded that *Anthurium andreanum* cv. Tropical performed its best under the treatment combination of 75 per cent shade + coco peat and coconut husk at 1:1 ratio as growing media along with 3 per cent humic acid spray at fortnight intervals + 750 ppm gibberellic acid spray at monthly intervals (N₃ × G₁), followed by the treatment combination of 75 per cent shade + coco peat and coconut husk at 1:1 ratio as growing media along with 3 per cent humic acid spray at fortnight interval + 750 ppm benzyladenine spray at monthly intervals (N₃ × G₃).