BIBLIOGRAPHY

ARIEL C. MAGALGALIT. APRIL 2012. Growth, Flowering and Yield of Ten Anthurium Accessions as Affected by Different Rates of Plantmate Organic Fertilizer.Benguet State University, La Trinidad Benguet.

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ABSTRACT

This study was conducted at the Ornamental Horticulture Research Area, Benguet State University, La Trinidad Benguet from may 2011 to October 2011, to determine the growth, flowering and yield of ten Anthurium accessions as affected by different rate of plantmate organic fertilizer and to determine the economics of using plantmate organic fertilizer in Anthuriumcutflower production.

Results show that there were no significant differences on plant height at flowering, number of leaves per plant at flowering, number of days from harvesting of the first flower to flower bud formation of the second flower, number of days from flower bud formation to harvesting stage, length and width of the spathe and vaselife of cutflowers as affected by different rates of plantmate organic fertilizer. However, on the stem length of cutflowers at harvest, plants applied with 150 grams per pot of plantmate organic fertilizer produced taller plants with longer stems compared to other plants applied with the other rates of plantmate fertilizer. Economically**,** BSU #5 applied with 150g plantmate per pot obtained the highest return on investment with 114.35%. Cutflowers produced in this treatment were classified as medium grade with a retail price of Php90.00 per dozen.

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INTRODUCTION

Anthurium is native of Columbia. It belongs to the family Araceae of which other members are Dieffebachias, Caladiums, Philodendrons, Aglaonemas, and other alocacias. It has more than 100 genera and about 1500 species, chiefly from the tropics. Anthurium is frown for their showy spathe and spadices including their velvetly leaves.

The Anthurium flower consists of the spathe, spadix, and peduncle. The individual or true flowers are borne on the spadix. The spadix is the candle like structure protruding from the base of the spathe. The spathe is classified according to the prominence of the veins. Spathes with prominent longitudal veins are called medium veined and those with few veins are called smooth veined. Spathecomes different colors of red, pink, orange, or white. They also vary in shape and color intensity (Rosario, 1981).

Plantmate organic fertilizer product is the result of an accelerated decomposition of biodegradable materials, both from plant and animal origin, through an advanced biofermentation process involving twenty (20) naturally-occurring microorganisms. To enhance its efficacy as a fertilizer chelated trace elements, enzymes, growth promotant, and other functional compounds were added to fortify the mixture.

Its chemical properties are as follows:

Total nitrogen	2.44%	Total magnesium	0.19%
Total phosphorus	3.74%	amino acids- adequate and balance	
Total potassium	3.61%	micronutrients- adequate and balance	
Total calcium	4.46%		

Bacteria and fungi for decomposition, enzyme, probiotic production, and nutrient transformation including nitrogen fixing bacteria are some of the beneficial microorganisms that are found in this fertilizer.

The advantages of plantmate organic fertilizer in crop production are as follows:

a. promotes nitrogen fixation as well as that of the other major elements

b. contains microorganisms that have the ability to produce natural enzymes

c. it is an excellent soil condition

d. builds up the organic matter content of the soil

The study was conducted to:

1. determine the effect of Plantmate organic fertilizer on the growth, flowering, and cutflower yield of ten Anthurium accessions.

2. determine the best rate/s of plantmate organic fertilizer that will give optimum growth and improve flower quality of anthurium.

3. determine the economics of using plantmate organic fertilizer in Anthuriumcutflower production.

The study was conducted at Benguet State University, Ornamental Horticulture Research Area La Trinidad Benguet from March 2011 to June 2011.

REVIEW OF LITERATURE

Description of Anthurium

Anthurium grows in many forms, mostly evergreen, bushy or climbing epiphytes with its root that can hang from the canopy all the way to the floor. Anthurium flowers are developed crowded in a spike on a fleshy axis, called a spadix, a characteristics of the Araceae. The flowers on the spadix are often divided sexually with a sterile band separating male from female flowers. This spadix can take can take on many forms (club-shaped, tapered, spiraled, and globed-shaped) and colors (white, green, red, pink, or a combination).

The spadix is part of an inflorescence, the outer portion of which is known as the spathe. The spathe may be sing color (yellow, green, or white) or possibly multicolored including burgundy and red. That sometimes colorful, solitary spathe is a showy modified bract that can be somewhat leathery in texture. Anthurium grown for the florist trade generally has highly colored spathe and spadices (Bautista *et al*., 1983).

Light Requirement

Shade is necessary for the growth of the Anthurium. The degree of shading varies with the cultivar, the age of the plant and the climate under which it is grown. The shade requirements usually range from 60-80% of full sunlight. Insufficient shading often results in damage to leaves and eventually death of the plant. Shaded cloth housed have the following advantages: they provide unformed shade, plants may be planted immediately after construction, reduce bird and insect damage to minimum, prove maximum freedom or work space and produce more flowers per unit area (Halvey and Mayak, 1979).

Temperature Requirement

Halevy and Mayak stated that Anthurium best thrives when the temperature between 18 – 27 degrees centigrade. Low temperature causes a decrease in number of flowers produced per plant but this offset by the development of a bigger spathe with better color intensity.

Growth Medium

Anthurium grows in a high organic, well aerated with good water retention capability medium, but also good drainage. A good medium is one that is able to anchor the roots and stem so that plant will not topple over as it grows upward yet provide sufficient moisture, nutrients and aeration of the plant. The following criteria must be considered in the selection of media: manure, sugarcane bagasse, cane ash commonly used in commercial cultivation. Small producers use a variety of materials, namely wood shavings, sawdust, leaf prunings, wood charcoal and farmyard manure. Sugar cane straw or bagasse is being used in mulch (Rimando, 1981).

Irrigation

The amount and frequency of watering depends on the medium, degree of shading and the prevailing climatic conditions in the production area. The medium should always be moist but not very wet. Misting the plants would certainly help in keeping them healthier. The frequency of the irrigation of flowering plant varies with soil texture; photo period, temperature, humidity, and the mass of the plant relative to the loss of water (Bautista *et al*., 1983).

Fertilizer Application

Fertilizer application is one of the most important ingredients to the total recipe to grow plants. Plant needs water, air, light, nutrition, soil and temperature all in proper volume or amount in all stages of development (Scotts, 1996).

Local Anthurium is both organic and non-organic fertilizer users. The amount depends on the medium used. Light conditions and cultivars for small plants or suckers used are applied to enhance growth. Complete fertilizer such as 5-10-10 or 14-14-14 is applied to the rate on the table spoon per gallon of water. They should be dissolved in water either sprayed or applied on media (Rosario, 1981). She further stated that gradual fertilizer when directly applied tend to burn and damage roots especially when the plants are not watered at once besides, the fertilizers will be leached easily without having been fully absorbed by the roots.

Organic Fertilizers

Naturally occurring organic fertilizers include manure, slurry, worm castings, peat, seaweed, sewage, and guano. Green manure crops are also grown to add nutrients to the soil. Naturally occurring minerals such as mine rock phosphate, sulfate of potash and limestone are also considered organic fertilizers.

Manufactured organic fertilizers include compost, bloodmeal, bonemeal, and seaweed extracts. Other examples are natural enzyme, digested proteins, fishmeal, and feather meal. The decomposing crop residue from prior years is another source of fertility. Bloodmeal contain about 15% nitrogen, bonemeal contain about 21% phosphorus, and wood ashes contain about 7% potassium. Mix one part bloodmeal, one part bonemeal, and two parts wood ashes and you get an organic fertilizer supplying nitrogen, phosphorus, and potassium in the ratio 5-6-4.

Apart from making the soil rich for more intensive crop production, organic fertilization offers the following benefits:

1. Improves the physical structure of the soil. Cultivation becomes easier because soil rich in organic matter is soft and easily crumbles. The soil does not become compacted;

2. Improves soil tilt, aeration and water holding capacity; the soil does not dry out easily;

3. Compost helps suppress weeds that compete with crops for moisture, nutrients, space, and light.

4. The population of beneficial microbes in compost helps improve soil fertility through nitrogen fixation;

5. Chemical compounds and enzymes produced by soil microbes support plant growth and development;

6. Organic matter contains macro, micro, and trace elements essential for plant growth and development;

7. Organic matter also contains hormones, auxins and antibiotics that benefits plants;

8. Organic fertilizer improves plant vigor and yield, sweetness and color of fruits, vegetables and flowers;

9. Antibiotics produced by soil microbes provide plants with additional resistance to attacking pests and diseases

MATERIALS AND METHODS

Materials

There were thirty (30) sample plants each from each of the ten (10) BSU Anthurium Accessions and the Plantmate organic fertilizer were used in the study.

Methods

The treatments were arranged in factorial Randomized Complete Block Design (RCBD) with 3 replications per treatment.

Cultural management such as watering, fertilizer application, and other management/operations were done uniformly and regularly to all sample plants to ensure good growth and yield.

The treatments were as follows:

Factor A: Anthurium accessions

1. BSU #1
2. BSU #2
3. BSU #5
4. BSU #6
5. BSU #7
6. BSU #9
7. BSU #14
8. BSU #16
9. BSU #19
10. BSU #21

Factor B: Rate of Plantmate Application (g/10"pot)

T1- control

T2- 50

T3- 100

T4- 150

T5- 200

Data Gathered

A. Vegetative Growth

1. Initial and final height of the plant (cm). Initial height of plant was measured at transplanting date and the final height at the termination of observations.

2. Number of leaves per plant at transplanting and at flowering. Number of leaves per plant were counted at planting and flowering (75% anthesis) of the second flower.

B. Yield

1. Number of cut flowers produced per plant. Number of cut flowers will be counted from the start up to the termination of the study.

C. Reproductive Growth

1. Days from harvesting of the first flower to flower bud formation (1cm bud size) of the second flower.

2. Days from flower bud formation to harvesting stage (3/4 maturity)

D. Cutflower Quality

1. Flower size (cm). The length and width of the spathe of the cutflowers harvested were measured and were classified as follows:

Grade Classification	Length and Width of Spathe (cm)
Miniature	less than 7.62
Small	7.63-10.16
Medium	10.17-12.20
Large	12.18-15.00
Extra large	more than 15.00

2. Stem length of the cutflower at harvest (cm)This was measured at ¾ maturity of the cutflowers.

3. Vaselife- (days) Basal end of the cutflowers were cut in a slanting manner and the number of days was counted from holding of the cutflowers in the vase to the onset of the senescence using350 ml. tap water only under ambient condition. There were 3 replications used per treatment with 2 samples in each replication.

E. Occurrence of Insect Pests and Diseases

Observation of insect pest infestation and symptoms of diseases were recorded for the duration of the study.

F. Documentation

The study was documented through pictures (Figures 1 to 12).

E. Cost and Return Analysis.

This was obtained by recording all the expenses incurred in the different rate of plantmate application in anthuriumcutflower production and gross receipt using this formula:

$$ROI = \frac{\text{Gross-Expenses}}{\text{expenses}} \times 100$$

Figure 1. Overview of the experimental area

Figure 2. Overview of the experimental area

Figure 3. Overview of Anthurium accession BSU# 1

Figure 4. Overview of Anthurium accession BSU# 2

Figure 5. Overview of Anthurium accession BSU# 5

Figure 6. Overview of Anthurium accession BSU# 6

Figure 7. Overview of Anthurium accession BSU# 7

Figure 8. Overview of Anthurium accession BSU# 9

Figure 9. Overview of Anthurium accession BSU# 14

Figure 10. Overview of Anthurium accession BSU# 16

Figure 11. Overview of Anthurium accession BSU# 19

Figure 12. Overview of Anthurium accession BSU# 21

RESULTS AND DISCUSSION

Final Height at Harvesting Stage

Effect of variety. Table 1 show that there were no significant differences on the final height at harvesting stage as affected by different anthurium accessions. However, two varieties BSU#19 and BSU #21 were shorter than the other varieties because of their natural inherent characteristics.

Effect of rate of plantmate application. Similarly, Table 1 shows that there were no significant differences on the final height at harvesting stage of anthuriumcutflower production as affected by different rate of plantmate application.

Interaction effect. Table 1 shows that there were no significant differences on the final height at harvesting stage obtained asa affected by the 10 anthurium accessions grown and the different rate of plantmate application.

Number of leaves per Plant at Flowering (75% Maturity)

Effect of variety.Table 2 show that there were no significant differences obtained on the number of leaves per plant at flowering as affected different anthurium accessions. The leaf count ranges from 4.07 to 5.20 leaves per plant at flowering.

Effect of rate of plantmate application. Results show that there were no significant differences obtained on the number of leaves at flowering as affected by the different rates of plantmate application.

Interaction effect. Interaction effects between the different varieties and different rate rates of plantmate application on the number of leaves were not significant.

Table 1. Final height of the plant at flowering

TREATMENT	FINAL HEIGHT (cm)
Variety	
BSU# 1	36.93[a]
BSU# 2	36.20[a]
BSU# 5	38.07[a]
BSU# 6	37.67[a]
BSU# 7	37.47[a]
BSU# 9	37.53[a]
BSU# 14	38.40[a]
BSU# 16	37.47[a]
BSU# 19	30.53[b]
BSU# 21	29.67[b]
Rate of Plantmate Application (g/pot)	
0 (control)	35.77[a]
50	36.03[a]
100	36.27[a]
150	36.08[a]
200	35.70[a]

Means with a common letter are not significantly different at 5% level by DMRT.

Number of Days From Harvesting of the First Flower to
Flower Bud Formation of the Second Flower (1cm Bud Size)

Effect of variety. Table 3 show that there were no significant differences on the number of days from harvesting of the first flower to flower bud formation of the second flower as affected by variety grown; the mean ranges from 49.47 to 51.07 days.

Table 2. Number of leaves per plant at flowering stage

TREATMENT	NUMBER OF LEAVES
Variety	
BSU# 1	4.73[a]
BSU# 2	4.27[a]
BSU# 5	5.07[a]
BSU# 6	4.87[a]
BSU# 7	4.60[a]
BSU# 9	4.87[a]
BSU# 14	5.20[a]
BSU# 16	4.93[a]
BSU# 19	4.80[a]
BSU# 21	5.07[a]
Rate of Plantmate Application (g/pot)	
0 (control)	4.73[a]
50	4.87[a]
100	4.97[a]
150	5.13[a]
200	4.90[a]

Means with a common letter are not significantly different at 5% level by DMRT.

Effect of rate of plantmate application. Results show that there were no significant differences on the number of days from harvesting of the first flower to flower bud formation of the second flower as affected by different rates of plantmate applied.

Interaction effect. Interaction effect on the number of days from harvesting of the first flower to flower bud formation of the second flower as affected by different anthurium accession and different rate of plantmate application were likewise not significant.

Table 3.days to flower bud formation

TREATMENT	MEAN
Variety	
BSU# 1	49.47[a]
BSU# 2	51.00[a]
BSU# 5	50.00[a]
BSU# 6	51.00[a]
BSU# 7	50.00[a]
BSU# 9	51.00[a]
BSU# 14	51.00[a]
BSU# 16	50.00[a]
BSU# 19	50.00[a]
BSU# 21	51.07[a]
Rate of Plantmate Application (g/pot)	
0 (control)	51.13[a]
50	51.20[a]
100	50.37[a]
150	50.07[a]
200	50.43[a]

Means with a common letter are not significantly different at 5% level by DMRT.

Number of Days from Flower Bud Formation to Harvesting Stage

Effect of variety.Table 4 show that there were no significant differences on the number of days from flower bud formation to harvesting stage. Mean ranges from 48.80 to 52.60 days.

Effect of rates of plantmate application.Effects of different rate of plantmate application likewise show that there were no significant differences on the number of days from flower bud formatiob to harvesting stage.

Interaction effect. Interaction effect on the number of days from flower bud formation to harvesting stage as affected by different anthurium accessions and different rate of plantmate application were not significant.

Length and Width of the Spathe

Effect of variety. Statistical analysis shows that there were no significant differences on the length and width of the spathe of the cutflower at harvest as affected by the variety of Anthurium grown. Length of the spathe ranges from 9.67 to 13.17 cm; while spathe width ranges from 9.83 to 13.47 cm at ¾ maturty.

Effect of rate of plantmate application. Results show that there were no significant differences on the length and width of the spathe as affected by different rates of plantmate application.

Interaction effect. There were no significant interaction effect between the 10 anthurium accession and different rates of plantmate application on the length and width of the spathe at ¾ maturity.

Table 4.number of days from flower bud formation to harvesting stage

TREATMENT	MEAN (Days)
Variety	
BSU# 1	52.60[a]
BSU# 2	53.00[a]
BSU# 5	53.20[a]
BSU# 6	51.20[a]
BSU# 7	51.20[a]
BSU# 9	51.60[a]
BSU# 14	50.40[a]
BSU# 16	51.40[a]
BSU #19	49.40[a]
BSU# 21	48.80[a]
Rate of Plantmate Application (g/pot)	
0 (control)	52[a]
50	51.20[a]
100	51.60[a]
150	50.70[a]
200	50.70[a]

Means with a common letter are not significantly different at 5% level by DMRT.

Stem Length of Cutflower (cm)

Effect of variety. No significant differences found on the stem length of cut flowers of the ten Anthurium Accessions as affected by variety. However, two varieties which are BSU#19 and BSU #21 were shorter than the other varieties because of their natural characteristics.

Table 5. Length and width of the spathe

TREATMENT	LENGTH (cm)	WIDTH (cm)	GRADE CLASSIFICATION
Variety			
BSU# 1	9.83[a]	9.67[a]	Small
BSU# 2	9.93[a]	9.93[a]	Small
BSU# 5	12.07[a]	11.73[a]	Medium
BSU# 6	9.60[a]	9.53[a]	Small
BSU# 7	10.03[a]	9.87[a]	Small
BSU# 9	12.37[a]	12.20[a]	Large
BSU# 14	13.47[a]	13.17[a]	Large
BSU# 16	12.67[a]	12.40[a]	Large
BSU# 19	8.10[a]	7.67[a]	Small
BSU# 21	7.27[a]	6.67[a]	Miniature
Rate of Plantmate Application (g/pot)			
0 (control)	9.90[a]	10.18[a]	Small
50	10.18[a]	10.33[a]	Medium
100	10.37[a]	10.55[a]	Medium
150	10.45[a]	10.82[a]	Medium
200	10.52[a]	10.78[a]	Medium

Means with a common letter are not significantly different at 5% level by DMRT.

The variety with the longest stem length was BSU# 1 with a mean of 39.53 cm while the shortest was BSU# 21 with a mean of 30.60 cm.

Effect of rates of plantmate application. Highly significant differences were observed on the stem length of the cutflowers as affected by different rates of plantmate application. Result show that plants applied with 150 grams of plantmate organic fertilizer obtained the longest stem length of 38.20 cm while the shortest was 36.53 cm that was measured from the control plants (without plantmate).

Interaction effect. Highly significant differences were observed on stem length as affected by different rates of plantmate application of different Anthurium accessions. Figure 13 show that plants treated with 150g of plantmate had the longest stem length of 38.20 cm while plants treated with control had the lowest stem length of 36.53 cm. On the other hand Figure 14 shows the effect of different rates of plantmate application on the ten (10) varieties used. BSU #5 obtained the tallest stem length with a mean of 40.23 followed by BSU #9 and BSU #16 with a mean of 39.83. BSU #19 and BSU #21 had the shortest stem length with a mean of 31.27 and 31.07.

Vaselife (days)

Effect of variety.Vaselife on the Anthuriumcutflowers produced as affected by different varieties had no significant differences. However, the variety with the longest vaselife was BSU# 14 with a total of 32.20 days.

Effect of rates of plantmate application. There were no significant differences on the vase life of Anthurium as affected by different rate of plantmate application. Vase life ranges from 30.93 days to 31.40 days from holding of the cutflower using tap water only as the holding solution.

Table 6. Stem length of cutflower

TREATMENT	STEM LENGTH (cm)
Variety	
BSU# 1	39.80[a]
BSU# 2	38.70[a]
BSU# 5	40.23[a]
BSU# 6	39.63[a]
BSU# 7	39.60[a]
BSU# 9	39.83[a]
BSU# 14	39.23[a]
BSU# 16	39.83[a]
BSU# 19	31.27[b]
BSU# 21	31.07[b]
Rate of Plantmate Application (g/pot)	
0 (control)	37.65[bc]
50	37.98[ab]
100	37.68[bc]
150	38.42[a]
200	37.87[a]

Means with a common letter are not significantly different at 5% level by DMRT.

Number of Cutflowers Produced Per Plant

Effect of variety. The number of cutflowers produced per plant in anthurium as affected by different varieties had no significant differences. However, BSU# 5 had the highest mean with 2.47 cutflowers while the lowest were harvested from BSU# 21, 16,14,9 and 7 having the same mean of 2.13 flowers per plant.

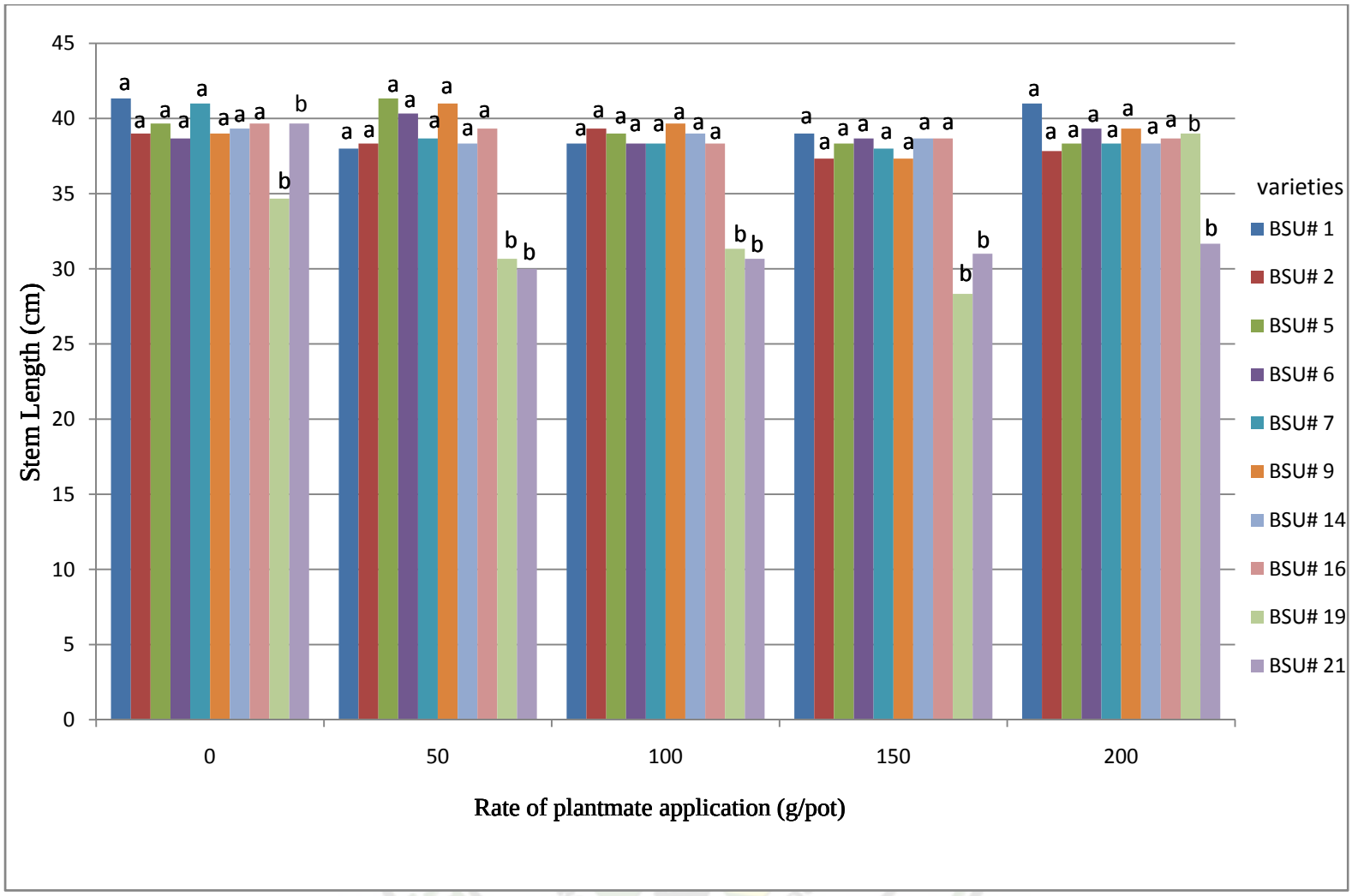

Figure 13. Stem length of cutflower at harvest (1st harvest)

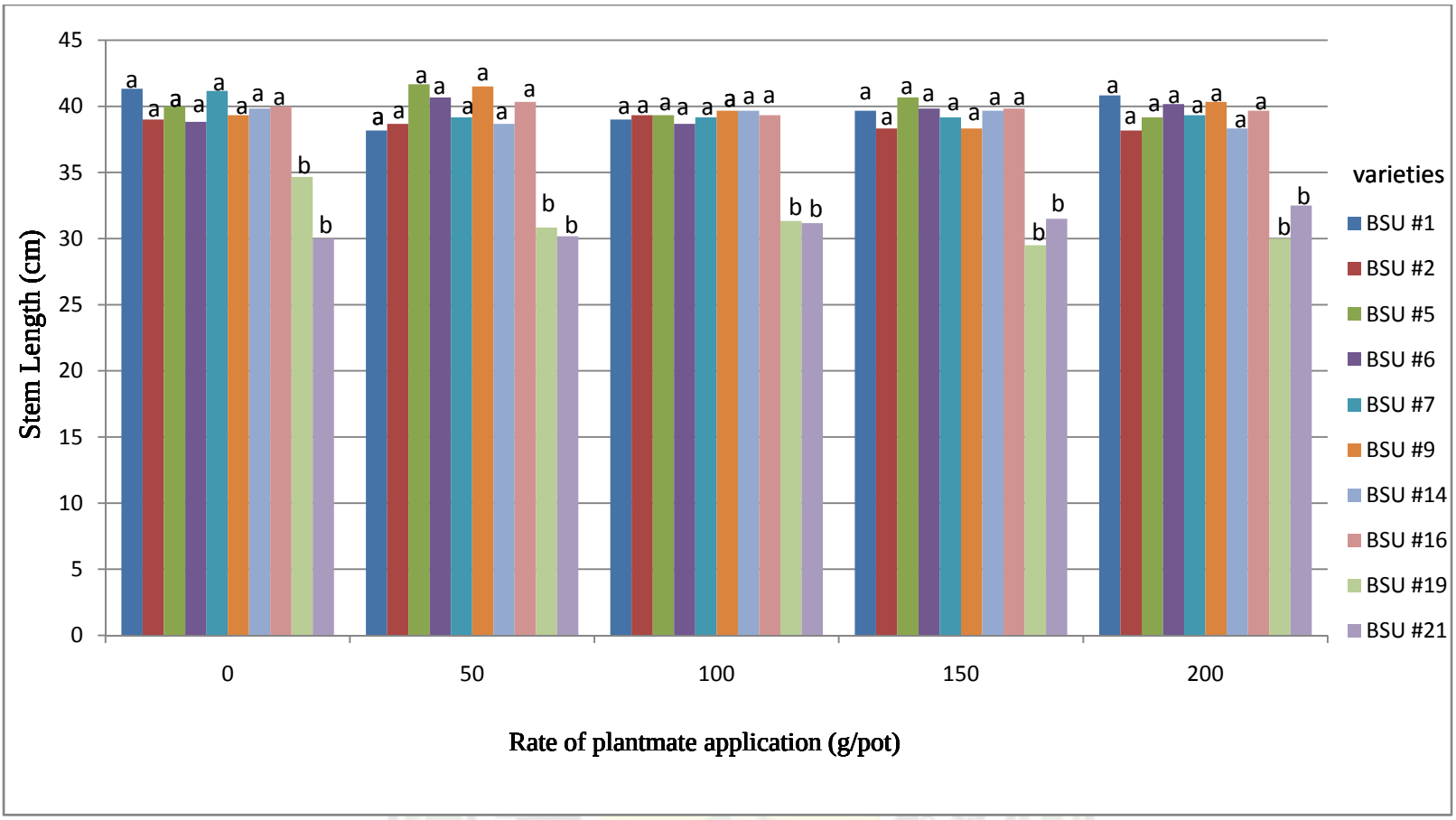

Figure 14. Stem length of cutflower at harvest (2st harvest)

Table 7.Vaselife of cutflowers at harvest.

TREATMENT	VASE LIFE (days)
Variety	
BSU# 1	31.20[a]
BSU# 2	30.60[a]
BSU# 5	32.07[a]
BSU# 6	30.47[a]
BSU# 7	30.40[a]
BSU# 9	30.73[a]
BSU# 14	32.20[a]
BSU# 16	32.00[a]
BSU# 19	31.20[a]
BSU# 21	30.40[a]
Rate of Plantmate Application (g/pot)	
0 (control)	31.20[a]
50	30.93[a]
100	31.23[a]
150	31.37[a]
200	31.40[a]

Means with a common letter are not significantly different at 5% level by DMRT.

Effect of rates of plantmate application. There were no significant differences on the number of cut flowers as affected by different rates of plantmate application. Number of cut flowers ranges from 2.33 to 2.167 per plant for the duration of the study.

Interaction effect. Interaction effects between 10 anthurium accessions and different rate of plantmate application on the number of cutflowers produced per plant were not significant.

Table 8. Number of cutflowers produced per plant

TREATMENT	MEAN
Variety	
BSU# 1	2.27[a]
BSU# 2	2.20[a]
BSU# 5	2.47[a]
BSU# 6	2.27[a]
BSU# 7	2.33[a]
BSU# 9	2.13[a]
BSU# 14	2.13[a]
BSU# 16	2.13[a]
BSU# 19	2.27[a]
BSU# 21	2.13[a]
Rate of Plantmate Application (g/pot)	
0 (control)	2.17[a]
50	2.20[a]
100	2.27[a]
150	2.33[a]
200	2.20[a]

Means with a common letter are not significantly different at 5% level by DMRT.

Cost and Return Analysis

Table 8 shows that plants applied with 50g plantmate per pot obtained the highest return on investment with 91.32%. Cutflowers produced in this treatment were classified as medium grade with a retail price of Php90.00 per dozen. The plants applied with 100g plantmate per pot obtained the second highest with an ROI of 75.51% followed by those treated with 150g and

200g plantmate per pot with an ROI of 67.40% and 47.10% respectively. On the other hand, the control plants obtained the lowest profit with only 32.73% return on investment.

Table 8a. Cost and return analysis

TREATMENT	MARKETABLE YIELD (Doz.)	GROSS SALE (Php)	EXPENSES (Php)	NET PROFIT (Php)	ROI (%)	RANK
BSU #1						
0	0.50	30.00	24.63	5.37	21.80	21
50	0.50	30.00	26.92	3.10	11.52	25
100	0.58	35.00	29.21	5.79	19.82	23
150	0.58	35.00	31.49	3.51	11.15	27
200	0.67	40.00	33.78	6.22	18.41	24
BSU #2						
0	0.58	35.00	24.63	10.37	42.10	15
50	0.50	30.00	26.92	3.10	11.52	25
100	0.50	30.00	29.21	0.79	2.71	22
150	0.67	40.00	31.49	8.51	27.04	19
200	0.50	30.00	33.78	-3.78	-11.19	30
BSU #5						
0	0.50	45.00	24.63	20.37	82.70	10
50	0.58	52.50	26.92	25.58	95.02	9
100	0.75	67.50	29.21	38.29	131.09	5
150	0.58	52.50	31.49	21.01	66.72	13
200	0.67	60.00	33.78	26.22	77.61	12
BSU #6						
0	0.50	30.00	24.63	5.37	21.80	21
50	0.58	35.00	26.92	8.08	30.02	18
100	0.58	35.00	29.21	5.79	19.82	23
150	0.67	40.00	31.49	8.51	27.02	20
200	0.50	30.00	33.78	-3.78	-11.19	30
BSU #7						
0	0.67	40.00	24.63	15.37	62.40	14
50	0.50	30.00	26.92	3.08	11.44	26
100	0.67	40.00	29.21	10.79	36.94	16
150	0.50	30.00	31.49	-1.49	-4.73	29
200	0.58	35.00	33.78	1.22	3.61	28
BSU #9						
0	0.50	60.00	24.63	35.37	143.60	3
50	0.50	60.00	26.92	33.08	122.88	6
100	0.58	70.00	29.21	40.79	139.64	4
150	0.58	70.00	31.49	38.51	122.29	7
200	0.50	60.00	33.78	26.22	77.62	11

Table 8a.continued…

BSU #14						
0	0.50	60.00	24.63	35.37	143.61	2
50	0.58	70.00	26.92	43.08	160.03	1
100	0.50	60.00	29.21	30.79	105.40	8
150	0.58	70.00	31.49	38.51	122.29	7
200	0.50	60.00	33.78	26.22	77.62	11
BSU #16						
0	0.50	60.00	24.63	35.37	143.61	2
50	0.50	60.00	26.92	33.08	122.88	6
100	0.58	70.00	29.21	40.79	139.64	4
150	0.58	70.00	31.49	38.51	122.29	7
200	0.50	60.00	33.78	26.22	77.61	12
BSU #19						
0	0.58	35.00	24.63	10.37	42.10	15
50	0.50	30.00	26.92	3.08	11.44	26
100	0.58	35.00	29.21	5.79	19.82	23
150	0.58	35.00	31.49	3.51	11.15	27
200	0.58	35.00	33.78	1.22	3.61	28
BSU #21						
0	0.50	30.00	24.63	5.37	21.80	21
50	0.58	35.00	26.92	8.08	30.73	17
100	0.58	35.00	29.21	5.79	19.82	23
150	0.50	30.00	31.49	-1.49	-4.73	29
200	0.50	30.00	33.78	-3.78	-11.19	30

Retail prices: small = Php 60.00/dozen, Medium = Php 90.00/dozen. Large = Php 110.00/dozen

Table 8b. Cost of production

INPUTS	QUANTITY	UNIT	UNIT PRICE	TOTAL (Php)
1. Fertilizer				
a. Plantmate organic fertilizer	25	kg	9.15/kg	230
2. Material				
a. PEP bag	150	piece/s	0.63/piece	94.50
3. Labor				
a. weeding, watering, and other cultural management	60	hours	20/hour	1,200
TOTAL				Php 1,524.50

SUMMARY, CONCLUSION AND ROCOMMENDATION

Summary

The study was conducted at Benguet State University, Ornamental Horticulture Research Area La Trinidad Benguet from May 2011 to November 2011. To determine the growth, flowering and yield of ten anthurium accessions as affected by different rate of plantmate organic fertilizer.

Results show that there were no significant differences noted on the duration of the flowering and flower development, final height at flowering and harvesting and size of spathe. Only the stem lengths of cutflowers at harvest were significantly longer in the plants aplliedwith 150g/pot of plantmate organic fertilizer.

Cost and return analysis also revealed good Return on Investment (ROI) in BSU #5 treated with 150g plantmate per pot which obtained the highest ROI of 114.35.

Conclusion

Based on the results, it is concluded that application of 150 grams of plantmate organic fertilizer on anthurium plants had improved the flowering and yield compared to that of the other rates of plantmate application. It is also concluded that BSU #5 plants applied with 150g plantmate per pot obtained the highest return on investment with 114.35%. Cutflowers produced in this treatment were classified as medium grade with a retail price of Php90.00 per dozen.

Recommendation

Based on the findings of the study, application of 150 grams of plantmate organic fertilizer should be used in anthuriumcutflower production. It is also recommended further that the 3 varieties which are BSU #5, BSU #14 and BSU #16 should be grown to obtain higher quality of anthuriumcutflowers with bigger spathe that commands higher price in the market that result to higher return on investment (ROI).

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APPENDICES

Appendix Table 1. Final height of the plant at harvesting stage (cm)

TREATMENT	REPLICATION			TOTAL	MEAN
	I	II	III		
$V_1 T_1$	40	38	32	110	36.67
T_2	39	41	32	112	37.33
T_3	38	32	42	112	37.33
T_4	36	42	32	110	36.67
T_5	38	37	35	110	36.67
$V_2 T_1$	35	36	36	108	36.00
T_2	36	36	35	107	35.67
T_3	35	38	36	109	36.33
T_4	33	40	39	112	37.33
T_5	36	36	35	107	35.66
$V_3 T_1$	37	44	35	113	37.67
T_2	38	42	37	117	39.00
T_3	38	39	38	115	38.33
T_4	37	36	38	111	37.00
T_5	38	36	38	112	37.33
$V_4 T_1$	35	35	43	113	37.67
T_2	36	38	36	110	36.67
T_3	40	38	39	117	39.00
T_4	36	39	39	114	38.00
T_5	37	37	37	111	37.00
$V_5 T_1$	35	36	37	108	36.00
T_2	42	34	37	112	37.33
T_3	40	37	38	115	38.33
T_4	38	38	38	114	38.00
T_5	36	39	37	112	37.33
$V_6 T_1$	38	35	40	113	37.67
T_2	33	35	41	109	36.33
T_3	37	42	34	113	37.67
T_4	38	34	44	116	38.67
T_5	40	31	41	112	37.33
$V_7 T_1$	35	40	40	115	38.33
T_2	35	41	40	116	38.67
T_3	44	34	36	114	38.00
T_4	35	35	45	115	38.33
T_5	39	36	41	116	38.67
$V_8 T_1$	37	37	39	113	37.67
T_2	38	36	41	115	38.33

Appendix Table 1.continued…

T_3	30	37	45	112	37.33
T_4	30	43	36	109	36.33
T_5	36	31	42	109	36.33
V_9 T_1	29	29	32	91	30.00
T_2	30	32	32	94	31.33
T_3	32	27	29	88	29.33
T_4	32	33	30	95	31.67
T_5	29	29	32	90	30.00
V_{10} T_1	27	29	30	86	28.67
T_2	32	28	28	88	29.33
T_3	32	30	31	93	31.00
T_4	29	30	27	86	28.67
T_5	32	30	30	92	30.67

ANALYSIS OF VARIANCE

SOURCE OF VARIATION	DEGREES OF FREEDOM	SUM OF SQUARE	MEAN OF SQUARE	COMPUTED F	TABULAR F 0.05	TABULAR F 0.01
Replication	2	27.213	13.607	1.2714	1.48	1.74
Factor A	9	1344.700	149.411	13.9612**	1.98	2.59
Factor B	4	6.467	1.617	0.1511	2.46	3.52
AB	36	73.667	2.046	0.1912	1.54	1.83
Error	98	1048.787	10.702			
TOTAL	149	2500.833				

**-Highly significant Coefficient of variation 9.10%

Appendix table 2. Number of leaves per plant at harvesting stage (¾ maturity)

TREATMENT	REPLICATION			TOTAL	MEAN
	I	II	III		
$V_1 T_1$	5	5	5	15	5.00
T_2	4	3	6	13	4.33
T_3	5	5	5	15	5.00
T_4	5	4	6	15	5.00
T_5	5	4	4	13	4.33
$V_2 T_1$	6	4	5	15	5.00
T_2	5	5	5	15	5.00
T_3	5	4	6	15	5.00
T_4	5	5	6	16	5.33
T_5	5	5	5	15	5.00
$V_3 T_1$	5	5	4	14	4.67
T_2	6	6	4	16	5.33
T_3	4	6	6	16	5.33
T_4	5	5	6	16	5.33
T_5	5	5	6	16	5.33
$V_4 T_1$	5	5	5	15	5.00
T_2	5	5	4	14	4.67
T_3	5	4	6	15	5.00
T_4	5	5	5	15	5.00
T_5	4	5	5	14	4.67
$V_5 T_1$	4	5	4	13	4.33
T_2	5	4	6	15	5.00
T_3	5	4	4	13	4.33
T_4	4	5	6	15	5.00
T_5	5	5	3	13	4.33
$V_6 T_1$	5	5	4	14	4.67
T_2	6	4	4	14	4.67
T_3	5	5	5	15	5.00
T_4	5	6	4	15	5.00
T_5	5	5	5	15	5.00
$V_7 T_1$	5	4	6	14	4.67
T_2	5	4	6	15	5.00
T_3	5	5	6	16	5.33
T_4	5	5	5	16	5.33
T_5	5	5	5	15	5.00
$V_8 T_1$	4	4	4	13	4.33
T_2	5	6	5	15	5.00
T_3	6	5	6	16	5.33
T_4	4	5	5	15	5.00
T_5	4	6	5	15	5.00

Appendix table 2. continued…

V_9 T_1	6	5	3	14	4.67
T_2	5	5	5	15	5.00
T_3	5	5	3	13	4.33
T_4	5	4	6	15	5.00
T_5	5	5	5	15	5.00
V_{10} T_1	5	5	5	15	5.00
T_2	5	3	6	14	4.67
T_3	5	5	5	15	5.00
T_4	5	5	6	16	5.33
T_5	6	6	4	16	5.33

ANALYSIS OF VARIANCE

SOURCE OF VARIATION	DEGREES OF FREEDOM	SUM OF SQUARE	MEAN OF SQUARE	COMPUTED F	TABULAR F 0.05	TABULAR F 0.01
Replication	2	1.120	0.560	0.8636	1.48	1.74
Factor A	9	4.507	0.501	0.7722	1.98	2.59
Factor B	4	2.573	0.643	0.9921	2.46	3.52
AB	36	7.293	0.203	0.3124	1.54	1.83
Error	98	63.547	0.648			
TOTAL	149	79.040				

ns- not significant Coefficient of variation= 16.37%

Appendix table 3. Days from harvesting of first flower to flower bud formation of second flower (1cm bud size)

TREATMENT	REPLICATION			TOTAL	MEAN
	I	II	III		
$V_1 T_1$	55	44	50	149	49.67
T_2	49	53	51	153	51.00
T_3	45	49	53	147	49.00
T_4	47	48	51	146	48.67
T_5	50	50	47	147	49.00
$V_2 T_1$	51	53	51	155	51.67
T_2	49	55	51	155	51.67
T_3	50	50	54	154	51.33
T_4	49	50	51	150	50.00
T_5	54	49	48	151	50.33
$V_3 T_1$	47	55	48	150	50.00
T_2	51	50	51	152	50.67
T_3	53	48	51	152	50.67
T_4	50	47	49	146	48.67
T_5	49	52	49	150	50.00
$V_4 T_1$	55	49	51	155	51.67
T_2	51	50	53	144	51.33
T_3	49	50	50	159	49.67
T_4	49	49	55	153	51.00
T_5	48	52	54	154	51.33
$V_5 T_1$	55	53	46	154	51.33
T_2	55	55	45	155	50.33
T_3	47	55	49	151	51.67
T_4	49	52	50	151	50.33
T_5	55	50	48	153	50.33
$V_6 T_1$	49	55	53	157	51.00
T_2	55	51	48	154	52.33
T_3	48	53	52	154	51.33
T_4	52	52	49	153	51.33
T_5	51	50	49	150	51.00
$V_7 T_1$	53	53	50	156	50.00
T_2	47	53	55	155	52.00
T_3	55	50	47	152	51.67
T_4	49	52	50	151	50.33
T_5	52	51	50	153	51.00
$V_8 T_1$	51	53	49	153	51.00
T_2	55	46	52	153	51.00
T_3	47	53	50	150	50.00

Appendix table 3. continued…

T_4	48	51	50	149	49.67
T_5	51	46	54	151	50.33
V_9 T_1	49	51	51	151	50.33
T_2	49	50	53	152	50.67
T_3	53	50	47	150	50.00
T_4	51	49	50	150	50.00
T_5	54	48	49	151	50.00
V_{10} T_1	55	48	51	154	51.33
T_2	49	49	55	153	51.00
T_3	51	51	51	153	51.00
T_4	45	53	55	153	51.00
T_5	48	52	53	153	51.00

ANALYSIS OF VARIANCE

SOURCE OF VARIATION	DEGREES OF FREEDOM	SUM OF SQUARE	MEAN OF SQUARE	COMPUTED F	TABULAR F 0.05	TABULAR F 0.01
Replication	2	1.080	0.540	0.0591	1.48	1.74
Factor A	9	44.960	4.996	0.5466	1.98	2.59
Factor B	4	30.093	7.523	7.523	2.46	3.52
AB	34	26.840	0.746	0.8232	1.54	1.83
Error	98	895.587	9.139	9.139		
TOTAL	149	998.560				

ns-not significant Coefficient of variation= 5.97%

Appendix table 4. Days from flower bud formation to harvesting (3/4 maturity)

TREATMENT	REPLICATION			TOTAL	MEAN
	I	II	III		
$V_1 T_1$	50	50	53	153	51.00
T_2	50	53	53	156	52.00
T_3	53	53	56	162	54.00
T_4	53	50	56	159	53.00
T_5	53	53	53	159	53.00
$V_2 T_1$	56	53	53	162	54.00
T_2	50	50	56	156	52.00
T_3	53	56	53	159	53.00
T_4	56	53	53	159	53.00
T_5	50	56	47	153	51.00
$V_3 T_1$	56	56	50	162	54.00
T_2	56	56	56	168	56.00
T_3	56	53	53	162	54.00
T_4	47	56	53	156	52.00
T_5	50	50	50	150	50.00
$V_4 T_1$	50	50	56	156	52.00
T_2	50	50	53	153	51.00
T_3	47	53	56	156	52.00
T_4	50	50	50	150	50.00
T_5	47	50	56	153	51.00
$V_5 T_1$	53	53	53	159	53.00
T_2	57	53	53	153	51.00
T_3	53	50	50	153	51.00
T_4	56	47	50	153	51.00
T_5	53	50	53	156	52.00
$V_6 T_1$	56	53	47	156	52.00
T_2	50	50	50	150	50.00
T_3	47	50	53	150	50.00
T_4	56	47	47	150	50.00
T_5	50	50	50	150	50.00
$V_7 T_1$	50	50	56	156	52.00
T_2	56	50	50	156	52.00
T_3	53	50	50	153	51.00
T_4	56	47	50	153	51.00
T_5	47	53	53	153	51.00
$V_8 T_1$	53	53	56	159	53.00
T_2	50	50	50	150	50.00
T_3	50	50	50	153	51.00
T_4	50	50	47	147	49.00
T_5	50	50	53	153	53.00

Appendix table 4. continued…

V_9 T_1	47	50	50	147	49.00
T_2	50	47	50	147	49.00
T_3	50	50	53	147	49.00
T_4	50	47	50	147	49.00
T_5	50	47	50	147	49.00
V_{10} T_1	47	50	50	147	49.00
T_2	47	50	50	147	49.00
T_3	50	50	47	147	49.00
T_4	50	47	47	144	48.00
T_5	47	50	50	147	49.00

ANALYSIS OF VARIANCE

SOURCE OF VARIATION	DEGREES OF FREEDOM	SUM OF SQUARE	MEAN OF SQUARE	COMPUTED F	TABULAR F 0.05	TABULAR F 0.01
Replication	2	15.960	7.980	1.1500	1.48	1.74
Factor A	9	287.760	31.973	4.6077**	1.98	2.59
Factor B	4	38.760	9.690	1.3964	2.46	3.52
AB	36	150.840	4.190	0.6038	1.54	1.83
Error	98	680.040	6.939			
TOTAL	149	1173.360				

**-Highly significant Coefficient of variation= 5.14%

Appendix table 5. Length of spathe (cm) at harvesting (3/4 maturity)

TREATMENT	REPLICATION			TOTAL	MEAN
	I	II	III		
V_1 T_1	8.00	9.50	10.50	28.00	9.33
T_2	10.00	9.00	11.00	30.00	10.00
T_3	10.00	8.00	12.00	30.00	10.00
T_4	8.00	11.00	8.00	27.00	9.00
T_5	10.00	12.00	8.00	30.00	10.00
V_2 T_1	10.00	12.00	8.00	30.00	10.00
T_2	8.00	8.00	11.00	27.00	9.00
T_3	9.00	10.00	12.00	31.00	10.33
T_4	8.00	10.00	12.50	30.50	10.17
T_5	10.50	8.00	12.00	30.50	10.17
V_3 T_1	8.00	12.00	12.00	32.00	10.67
T_2	12.00	14.00	10.00	36.00	12.00
T_3	12.00	12.00	12.00	36.00	12.00
T_4	13.00	10.00	13.00	36.00	12.00
T_5	13.00	11.00	12.00	36.00	12.00
V_4 T_1	9.00	10.00	9.00	28.00	9.33
T_2	9.00	9.00	9.00	27.00	9.00
T_3	12.00	9.00	8.00	29.00	9.67
T_4	10.00	10.00	10.00	28.00	9.33
T_5	10.00	10.00	9.00	27.00	9.00
V_5 T_1	10.00	9.00	10.00	29.00	9.67
T_2	10.00	10.00	10.00	30.00	10.00
T_3	10.00	9.00	9.00	28.00	9.33
T_4	10.00	12.00	9.00	31.00	10.33
T_5	12.00	9.00	9.00	30.00	10.00
V_6 T_1	9.00	13.00	11.00	33.00	11.00
T_2	11.00	14.00	9.50	34.50	11.50
T_3	14.00	11.50	14.00	39.50	13.17
T_4	11.00	13.00	14.00	38.00	12.67
T_5	13.00	13.00	12.00	38.00	12.67
V_7 T_1	11.00	12.00	11.00	34.00	11.33
T_2	14.00	12.00	16.00	39.00	13.00
T_3	14.00	12.00	12.00	38.00	12.67
T_4	12.00	13.00	11.00	36.00	12.00
T_5	13.00	12.00	14.00	39.00	13.00
V_8 T_1	12.00	15.00	13.00	40.00	13.33
T_2	15.00	12.00	13.00	40.00	13.33
T_3	12.00	13.00	12.50	37.50	12.50
T_4	14.00	14.00	13.00	41.00	13.67
T_5	12.00	13.00	14.00	39.00	13.00

Appendix table 5. continued…

V_9 T_1	9.00	7.00	7.00	23.00	7.67
T_2	8.00	7.00	7.00	22.00	7.33
T_3	7.00	8.00	8.00	23.00	7.33
T_4	8.00	8.00	8.00	24.00	8.00
T_5	8.00	7.00	8.00	23.00	7.33
V_{10} T_1	6.00	7.00	7.00	20.00	6.67
T_2	7.00	6.00	7.00	20.00	6.67
T_3	6.00	6.00	7.00	19.00	6.33
T_4	7.00	6.00	7.00	20.00	6.67
T_5	7.00	7.00	7.00	21.00	7.00

ANALYSIS OF VARIANCE

SOURCE OF VARIATION	DEGREES OF FREEDOM	SUM OF SQUARE	MEAN OF SQUARE	COMPUTED F	TABULAR F 0.05	TABULAR F 0.01
Replication	2	0.223	0.112	0.0645	1.48	1.74
Factor A	9	596.042	66.227	38.2281**	1.98	2.59
Factor B	4	7.383	1.846	1.0655	2.46	3.52
AB	36	26.283	0.730	0.4214	1.54	1.83
Error	98	169.777	1.732			
TOTAL	149	799.708				

**-Highly significant Coefficient of variation= 12.80%

Appendix table 6. Width of spathe (cm) at harvesting (3/4 maturity)

TREATMENT	REPLICATION			TOTAL	MEAN
	I	II	III		
$V_1 T_1$	7.50	10.50	10.50	28.50	9.50
T_2	9.50	8.00	13.00	30.50	10.17
T_3	9.50	10.00	11.00	30.50	10.17
T_4	10.00	10.50	8.00	28.50	9.50
T_5	9.00	13.00	7.50	29.50	9.83
$V_2 T_1$	9.00	12.00	9.50	30.50	10.17
T_2	7.50	8.00	13.00	28.50	9.50
T_3	9.50	10.00	10.50	30.00	10.00
T_4	8.00	9.50	12.00	29.50	9.83
T_5	10.00	7.50	13.00	30.50	10.17
$V_3 T_1$	8.50	12.00	13.00	33.50	11.17
T_2	12.00	15.00	9.00	36.00	12.00
T_3	12.00	12.00	12.50	36.50	12.17
T_4	14.00	10.50	13.00	34.50	12.50
T_5	13.50	11.00	13.00	34.50	12.50
$V_4 T_1$	9.50	10.50	8.50	28.50	9.50
T_2	9.50	9.00	9.50	28.00	9.33
T_3	11.00	10.00	8.50	29.50	9.83
T_4	9.00	9.00	12.00	30.00	10.00
T_5	10.00	8.50	9.50	28.00	9.33
$V_5 T_1$	11.00	8.00	10.50	29.50	9.83
T_2	9.00	11.00	10.00	30.00	10.00
T_3	10.00	9.50	9.00	28.50	9.50
T_4	10.00	11.00	10.50	31.50	10.50
T_5	12.00	10.00	9.00	31.00	10.33
$V_6 T_1$	9.50	13.50	11.00	34.00	11.33
T_2	12.50	15.50	7.50	35.50	11.83
T_3	12.00	12.00	11.00	35.50	11.83
T_4	12.00	14.00	15.00	41.00	13.67
T_5	17.00	11.00	11.50	39.50	13.17
$V_7 T_1$	10.50	12.50	13.00	35.50	11.83
T_2	12.00	13.00	11.00	36.00	12.00
T_3	13.50	13.00	14.00	50.50	13.50
T_4	11.00	15.00	11.50	37.00	12.33
T_5	18.00	9.00	13.00	40.00	13.33
$V_8 T_1$	14.00	17.00	9.00	40.00	13.33
T_2	18.00	9.50	13.00	40.50	13.50
T_3	13.00	12.50	14.00	39.50	13.17
T_4	15.00	15.50	11.00	41.50	13.83
T_5	12.00	12.50	16.00	40.50	13.50

Appendix table 6. continued…

V_9 T_1	8.50	7.00	8.00	23.50	7.83
T_2	7.50	8.00	8.00	23.50	7.83
T_3	9.00	9.00	7.00	25.00	8.33
T_4	7.50	8.00	9.00	24.50	8.17
T_5	9.00	8.50	7.50	25.00	8.33
V_{10} T_1	7.50	7.00	7.00	21.50	7.17
T_2	7.00	6.50	8.00	21.50	7.17
T_3	8.00	6.00	7.00	21.00	7.00
T_4	9.00	6.00	8.00	22.00	7.33
T_5	7.50	7.50	7.00	22.00	7.33

ANALYSIS OF VARIANCE

SOURCE OF VARIATION	DEGREES OF FREEDOM	SUM OF SQUARE	MEAN OF SQUARE	COMPUTED F	TABULAR F 0.05	TABULAR F 0.01
Replication	2	0.573	0.287	0.0735	1.48	1.74
Factor A	9	561.467	62.385	16.0007**	1.98	2.59
Factor B	4	9.167	2.292	0.5878	2.46	3.52
AB	36	20.033	0.556	0.1427	1.54	1.83
Error	98	382.093	3.899			
TOTAL	149	973.333				

**-Highly significant Coefficient of variation= 18.75%

Appendix table 7. Stem length of cutflower at harvest (cm)

TREATMENT	REPLICATION			TOTAL	MEAN
	I	II	III		
$V_1 T_1$	40.00	42.00	42.00	124.00	41.33
T_2	38.00	38.00	38.00	114.00	38.00
T_3	37.00	40.00	38.00	115.00	38.33
T_4	41.00	37.00	39.00	117.00	39.00
T_5	40.00	41.00	42.00	123.00	41.00
$V_2 T_1$	39.00	40.00	38.00	117.00	39.00
T_2	39.00	37.00	39.00	115.00	38.33
T_3	40.00	39.00	39.00	118.00	39.33
T_4	37.00	35.00	40.00	112.00	37.33
T_5	37.00	37.50	38.00	113.50	37.83
$V_3 T_1$	39.00	42.00	38.00	119.00	39.67
T_2	40.00	44.00	40.00	124.00	41.33
T_3	38.00	40.00	39.00	117.00	39.00
T_4	39.00	37.00	39.00	115.00	38.33
T_5	39.00	37.00	40.50	116.50	38.83
$V_4 T_1$	37.00	39.00	40.00	116.00	38.67
T_2	40.00	40.00	41.00	121.00	40.33
T_3	39.00	39.00	37.00	115.00	38.33
T_4	37.00	39.00	40.00	116.00	38.67
T_5	40.00	40.00	38.00	118.00	39.33
$V_5 T_1$	40.00	43.00	40.00	123.00	41.00
T_2	38.00	38.00	40.00	116.00	38.67
T_3	39.00	39.00	37.00	115.00	38.33
T_4	38.00	39.00	37.00	114.00	38.00
T_5	39.00	38.00	39.00	116.00	38.33
$V_6 T_1$	40.00	38.00	39.00	117.00	39.00
T_2	40.00	40.00	43.00	123.00	41.00
T_3	40.00	40.00	39.00	119.00	39.67
T_4	38.00	37.00	37.00	112.00	37.33
T_5	40.00	38.00	40.00	118.00	39.33
$V_7 T_1$	37.00	40.00	41.00	118.00	39.33
T_2	39.00	40.00	36.00	115.00	38.33
T_3	40.00	35.00	42.00	117.00	39.00
T_4	39.00	39.00	38.00	116.00	38.67
T_5	38.00	40.00	37.00	115.00	38.33
$V_8 T_1$	39.00	40.00	40.00	119.00	39.67
T_2	40.00	39.00	39.00	118.00	39.33
T_3	39.00	38.00	38.00	115.00	38.33
T_4	40.00	38.00	38.00	116.00	39.67
T_5	38.00	39.00	39.00	116.00	38.67

Appendix table 7. continued…

V_9 T_1	36.00	33.00	35.00	104.00	34.67
T_2	30.00	31.00	30.00	92.00	30.67
T_3	31.00	31.00	32.00	94.00	31.33
T_4	30.00	27.00	28.00	85.00	28.33
T_5	30.00	27.00	30.00	87.00	29.00
V_{10} T_1	30.00	30.00	29.00	89.00	39.67
T_2	30.00	30.00	30.00	90.00	30.00
T_3	28.00	31.00	33.00	92.00	30.67
T_4	31.00	32.00	30.00	93.00	31.00
T_5	31.00	33.00	31.00	95.00	31.67

ANALYSIS OF VARIANCE

SOURCE OF VARIATION	DEGREES OF FREEDOM	SUM OF SQUARE	MEAN OF SQUARE	COMPUTED F	TABULAR F 0.05	TABULAR F 0.01
Replication	2	0.630	0.315	0.1583	1.48	1.74
Factor A	9	1695.460	188.384	94.6575**	1.98	2.59
Factor B	4	43.693	10.923	5.4886**	2.46	3.52
AB	36	142.240	3.951	1.9853**	1.54	1.83
Error	98	195.037	1.990			
TOTAL	149	2077.060				

**-Highly significant Coefficient of variation= 3.78%

Appendix table 8. Vaselife of cutflower (days)

TREATMENT	REPLICATION			TOTAL	MEAN
	I	II	III		
$V_1 T_1$	29	30	30	89	29.67
T_2	30	34	30	94	31.33
T_3	29	33	33	95	31.67
T_4	35	30	30	95	31.67
T_5	30	30	35	95	31.67
$V_2 T_1$	32	30	30	92	30.67
T_2	32	27	27	86	28.67
T_3	32	32	32	96	32.00
T_4	31	30	32	93	31.00
T_5	32	30	30	92	30.67
$V_3 T_1$	32	32	32	96	32.00
T_2	35	30	32	97	32.33
T_3	29	30	30	89	29.67
T_4	35	35	32	102	34.00
T_5	32	35	32	99	33.00
$V_4 T_1$	30	32	32	94	31.33
T_2	30	30	30	90	30.00
T_3	29	33	32	94	31.33
T_4	31	28	30	89	29.67
T_5	30	30	30	90	30.00
$V_5 T_1$	30	32	32	94	31.33
T_2	32	30	30	92	30.67
T_3	32	32	32	96	32.00
T_4	30	30	30	90	30.00
T_5	32	35	32	99	33.00
$V_6 T_1$	32	32	32	96	32.00
T_2	30	32	30	92	30.67
T_3	30	30	30	90	30.00
T_4	30	32	32	94	31.33
T_5	30	29	30	89	29.67
$V_7 T_1$	32	30	34	96	32.00
T_2	30	30	35	95	31.67
T_3	32	30	30	92	30.67
T_4	35	33	30	98	32.67
T_5	32	35	33	100	33.33
$V_8 T_1$	32	32	32	96	32.00
T_2	30	30	35	95	31.67
T_3	35	32	32	99	33.00
T_4	35	30	33	98	32.00
T_5	32	30	30	92	30.67

Appendix table 8. continued…

V_9 T_1	30	32	33	95	31.67
T_2	32	27	33	92	30.67
T_3	32	30	35	97	32.33
T_4	30	32	32	94	31.33
T_5	30	30	30	90	30.00
V_{10} T_1	28	32	28	88	29.33
T_2	28	35	32	95	31.67
T_3	30	29	30	89	29.67
T_4	29	30	29	88	29.33
T_5	32	32	32	96	32.00

ANALYSIS OF VARIANCE

SOURCE OF VARIATION	DEGREES OF FREEDOM	SUM OF SQUARE	MEAN OF SQUARE	COMPUTED F	TABULAR F 0.05	TABULAR F 0.01
Replication	2	1.853	0.927	0.3066	1.48	1.74
Factor A	9	62.693	6.966	2.3051	1.98*	2.59
Factor B	4	4.093	1.023	0.3386	2.46	3.52
AB	36	141.507	3.931	1.3007	1.54	1.83
Error	98	296.147	3.022			
TOTAL	149	208.293				

*- significant Coefficient of variation= 5.57%

Appendix table 9. Total number of cutflowers produced per plant

TREATMENT	REPLICATION			TOTAL	MEAN
	I	II	III		
V_1 T_1	2	2	2	6	2.00
T_2	2	2	2	6	2.00
T_3	2	3	2	7	2.33
T_4	2	3	2	7	2.33
T_5	3	2	3	8	2.67
V_2 T_1	3	2	2	7	2.33
T_2	2	2	2	6	2.00
T_3	2	2	2	6	2.00
T_4	3	2	3	8	2.67
T_5	2	2	2	6	2.00
V_3 T_1	2	2	2	6	2.00
T_2	3	3	3	9	3.00
T_3	2	3	2	7	2.33
T_4	2	2	3	7	2.33
T_5	3	3	2	8	2.67
V_4 T_1	2	2	2	6	2.00
T_2	2	3	2	7	2.33
T_3	2	3	2	7	2.33
T_4	3	3	2	8	2.67
T_5	2	2	2	6	2.00
V_5 T_1	3	2	3	8	2.67
T_2	2	2	2	6	2.00
T_3	2	4	2	8	2.67
T_4	2	2	2	6	2.00
T_5	3	2	2	7	2.33
V_6 T_1	2	2	2	6	2.00
T_2	2	2	2	6	2.00
T_3	2	2	3	7	2.33
T_4	2	3	2	7	2.33
T_5	2	2	2	6	2.00
V_7 T_1	2	2	2	6	2.00
T_2	3	2	2	7	2.33
T_3	2	2	2	6	2.00
T_4	2	2	3	7	2.33
T_5	2	2	2	6	2.00
V_8 T_1	2	3	2	7	2.33
T_2	2	2	2	6	2.00
T_3	2	2	2	6	2.00
T_4	2	2	3	7	2.33
T_5	2	2	2	6	2.00

Appendix table 9. continued…

V_9 T_1	3	2	2	7	2.33
T_2	2	2	2	6	2.00
T_3	2	3	2	7	2.33
T_4	2	2	3	7	2.33
T_5	3	2	2	7	2.33
V_{10} T_1	2	2	2	6	2.00
T_2	2	3	2	7	2.33
T_3	3	2	2	7	2.33
T_4	2	2	2	6	2.00
T_5	2	2	2	6	2.00

ANALYSIS OF VARIANCE

SOURCE OF VARIATION	DEGREES OF FREEDOM	SUM OF SQUARE	MEAN OF SQUARE	COMPUTED F	TABULAR F 0.05	TABULAR F 0.01
Replication	2	0.253	0.127	0.6506	1.48	1.74
Factor A	9	1.633	0.181	0.9321	1.98	2.59
Factor B	4	0.533	0.133	0.6848	2.46	3.52
AB	36	7.333	0.204	1.0463	1.54	1.83
Error	98	19.080	0.195			
TOTAL	149	28.833				

ns-not significant Coefficient of variation= 19.76%