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 Anthurium cutflower 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.

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 anthurium cutflower 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 areBSU#19 and BSU #21 were shorter than the other varieties because of their natural characteristics.

Table 5. Length and width of the spathe

TREATMENT CLASSIFICATION	LENGTH (cm)	WIDTH (cm)	GRADE
Variety			
BSU# 1	9.83[a]	9.67 [a]	Small
BSU# 2	9.93 [a]	9.93 [a]	Small
BSU# 5 Medium	12.07 [a]	11.73 [a]	
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 Miniature	7.27 [a]	6.67 [a]	
Rate of Plantmate Application (g/pot)			
0 (control)	9.90 [a]	10.18 [a]	Small
50 Medium	10.18 [a]	10.33 [a]	
100 Medium	10.37 [a]	10.55 [a]	
150 Medium	10.45 [a]	10.82 [a]	
200 Medium	10.52[a]	10.78[a]	

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 Anthurium cutflowers 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.

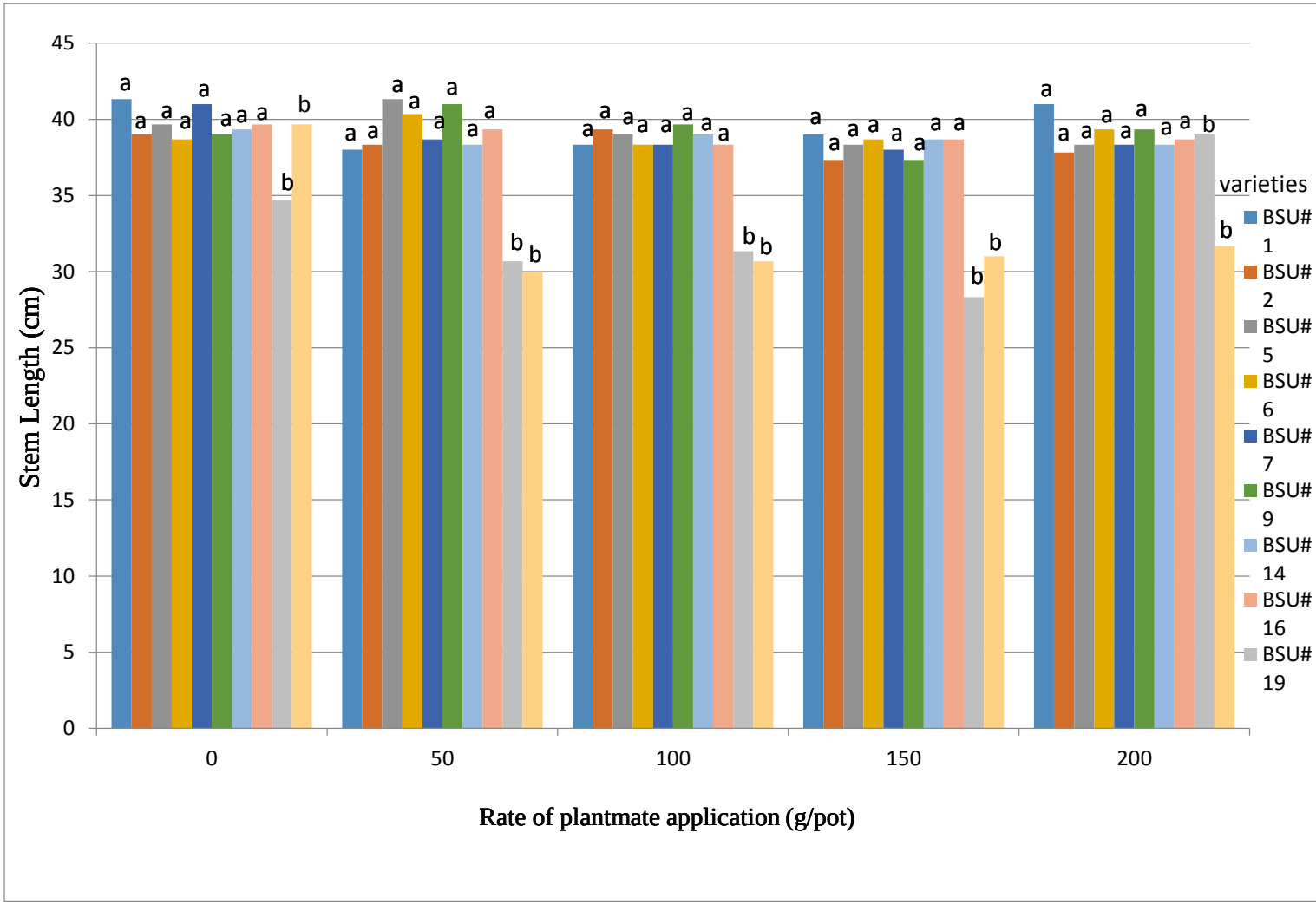

Figure 13. Stem length of cutflower at harvest (1st harvest)

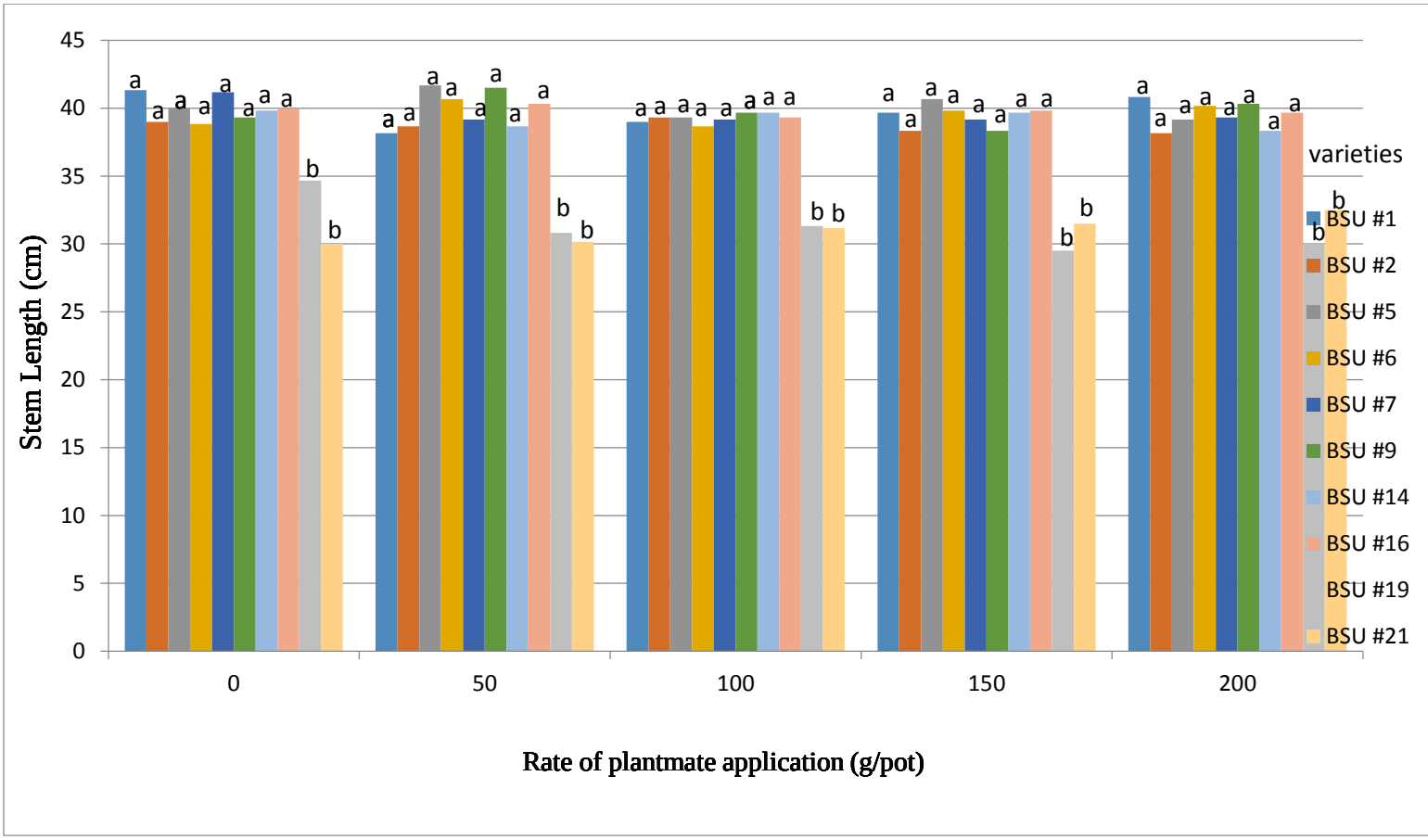

Figure 14. Stem length of cutflower at harvest (2st harvest)

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 RANK	MARKETABLE YIELD (Doz.)	GROSS SALE (Php)	EXPENSES (Php)	NET PROFIT (Php)	ROI (%)
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 230 organic fertilizer	25	kg	9.15/kg	
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 RECOMMENDATION

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 apllied with 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 anthurium cutflower 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 anthurium cutflowers with bigger spathe that commands higher price in the market that result to higher return on investment (ROI).

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