GROWTH PERFORMANCE OF LACATAN BANANA (*Musa sapientum* L.) FERTILIZED WITH DIFFERENT BRANDS OF COMMERCIAL ORGANIC FERTILIZER AT ILONG BUKID, SAN RAFAEL, ILOILO CONDITIONS: A COMMUNITY BASED PARTICIPATORY RESEARCH

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ABSTRACT

The study was conducted from February 26 to June 29, 2007 at Ilongbukid, San Rafael, Iloilo. It determined the efficiency of the different brands of organic fertilizer on the growth of lacatan banana and obtained baseline information for a follow-up study on farmer-researcher partnership on techno-transfer. The experimental treatments were laid out in a randomized complete block design with four replications. The experimental treatments consisted of three organic fertilizers namely: Bodega, Farmer's Choice and D & T. Bananas applied with granular fertilizer and plants without fertilizers were used as basis for comparison. The rate of fertilizers was based on the recommended rate of 90-30-120 kg of N, P_2O_5 and K_2O/ha. Results of the study revealed that bananas fertilized with Farmer's Choice (C) were higher and had more functional leaves. Furthermore, inorganic fertilized bananas were bigger in trunk size but were not significantly ($P>0.05$) bigger than those fertilized with Bodega, D & T, and the unfertilized plants.

INTRODUCTION

Lacatan (*Musa sapientum* L.) is one of the most distinct banana cultivars widely grown in the Philippines today. It grows in many soil types and land classification. It tolerates a wide range of soil pH from strong acidity of pH 3.4 to medium alkalinity of pH 7.8. It can thrive at an elevation of 1.5 to 1,000 meters above sea level and was found to produce sweeter fruits at elevation of 600 meters and more above sea level (PCARRD, 2004). Among the banana varieties, lacatan is the most popular table fruit preferred by most consumers due to its physical characteristics like sweetness and sturdiness that makes its ripened state last longer without affecting its taste (Castro, 2005).

Banana is a fast growing plant. As a biennial crop, it has a shorter maturity and bears fruit in less than a year depending on the presence of readily available large quantities of fertilizer. Fertilization, which is one of the critical practices in the production of banana, determines yield and the quality of fruits produced and eventually the success of the farming enterprise. Banana requires high organic matter content of not less than 2 to 5%, moderate amount of soil phosphorous of about 24 ppm and large amount of potassium of about 400 to 600 ppm (PCARRD, 2004).

Now a days, the use of organic fertilizer and the popularity of organically-grown food are on the rise. Organic fertilizer improves the physical and biological properties of the soil and contributes to its long term soil fertility (Sombilla, 1997). Since the release of nutrients in organic fertilizer is slow, it is not readily available to the plant (Brady & Weil, 1999) making its use sustaining and compatible with nature. The continuous use of synthetic chemical fertilizer in the guise of efficient production makes the soil acidic and kills beneficial soil microorganisms. Organic fertilizer gives the soil a crumbly structure allowing it to retain moisture for a long period of time. It aerates the soil such that the plant does not suffocate and gives food quality (Ranilo, 2001).

Bananas produced the organic way commands a premium price in the world market. It is easier to produce and is "environmentally friendly". Banana growers in Mindanao even produced organic banana in order to control the dreaded disease called Black sigatoka (Atienza, 2003). Banana plant nutrition is very essential in producing healthy plant and build up pest resistance and high quality fruits (PCARRD, 2004).

Since farmers will be directly involved in the banana cultural practices like planting, plowing, weeding, fertilizing, pest control and management as well as data collection, results of the study can affect and indicate reasonable participation for both farmer and researcher in techno-transfer and eventually economic decision making.

Objectives of the Study

The general objective of the study was to determine the growth performance of lacatan banana fertilized with different brands of commercial organic fertilizer. Specifically, this study was conducted:

1. To determine the height, trunk size, and number of functional leaves of lacatan banana as influenced by different brand of organic fertilizer, and
2. To formulate baseline information for a follow-up study on how effective farmer researcher partnership is in techno-transfer.

Time and Place of the Study

The study was conducted from February 26 to June 29, 2007 at Ilongbukid, San Rafael, Iloilo.

REVIEW OF RELATED LITERATURE

Organic Agriculture contributes in a big way to the preservation of biodiversity and to restoring ecological balance (Agriculture, 2004). Organic farming means a sustainable agriculture where almost all synthetic inputs are prohibited and "soil building" crop rotations is mandatory. It reduces or eliminates water pollution and helps conserve water and soil in the farm. It preserves natural nutrient and energy flows and enhances biodiversity. The use of organic manure and mulches improves soil structure and encourages development of a vigorous population of soil microorganisms. It reduces the use of toxic synthetic pesticides which poison an estimated three million people each year, thus leading to improved health of the farm family.

Natural Farming's "Golden Rule" is to feed the soil with organic matter. It is trough microbial activity that organic matter is converted to humus and become fertilizer economically (Mikkelson, 2005). If decomposed rice straw and animal manure is turned into compost, it is rich in nutrients and makes an excellent soil conditioner. When incorporated into the soil prior to land preparation it improves soil structure and productivity (Murphy, 2005).

The organic matter content of the world's agricultural soils which used to be 20%, now average less than 1%. Murphy (2005) citing, Prof. Piccolo of the Universitia degli Studi di Napoli Federico II in Italy (2003) stated that if 5% of the organic matter is raised to plow depth (approximately 25 cm), 150 billion tons of carbon dioxide would be sequestered into the soil. He stated further that our world generates 18 billion tons of carbon dioxide in 2002-2003.

Trichoderma harzianum a compost fungus activator known as CF, shorten the decomposition period of farm wastes from the usual five to six months to as short as three to five weeks (Agriculture, 1999).

Vermicompost has been proven to be an efficient and cost-effective soil amendment for improving fertility, enhancing microbial diversity and promoting plant growth. It was found out to effectively reduce insect infestation of pepper, tomatoes and cabbage in the green house and help in food security and improve the nutrition of the people. With organic gardening people also become more health conscious (Marañon, 2005).

An organic foliar fertilizer, called AZ41 that came from the combination of pure aloe vera powder (Manopol) and oil from the bark of Australian team (Melaleuca) has been found to effectively control insects pests and diseases of citrus such as pommelo, oranges and calamansi (Dhasmana, 2005).

While technology package for raising yields and income may seem readily available, the use of organic products may be induced by limitations such as high price or unavailability of agricultural inputs, lack of effective system for disseminating technology, unfavorable land term systems and credit and marketing facilities.

"Alternative agriculture" or "agro-ecology" like low external inputs and sustainable agriculture organic farming, biological farming, and vermiculture emphasize natural processes such as nutrient recycling, nitrogen fixation and pest predator. It balances and reduce the use of off-farm inputs especially fertilizer (Tacio, 2004).

The use of organic fertilizers in fertilizing banana and shunning away from pesticide in fertilizing banana is the battle cry by the private sector and some non-government associates in the Philippines today (Agriculture, 2003). Correct fertilization in banana can be accomplished through tissue analysis at various stages of plant growth and/or visual inspection of the condition of plant growth (The Philippine Recommends for Bananas, 1992).

For new plantings, banana must be fertilized with 1 to 2 tons per hectare of organic fertilizer applied at planting incorporated in the soil at adequate soil moisture (DA-WESVIARC, 2005).

METHODOLOGY

Selection of planting materials. Eighty 75 cm tall sword leaf suckers were taken from the Lacatan banana plantation of Western Visayas Integrated Agricultural Research Center (WESVIARCH), in Hamungaya, Buntatala, Jaro, Iloilo City.

The suckers were detached from the mother plant using a desuckering bar at around 6:00 to 7:00 o'clock in the morning. Dried leaf sheaths and all the roots were removed before planting to facilitate uniform root emergence.

Field preparation and planting. A total experimental area of 648 m^2 was plowed and harrowed using a carabao drawn plow. Eighty planting holes of about 30 to 40 cm^3 were dug, into each of which was planted. Plants were spaced 3 m between hills and 3 m between rows. A premarked or knotted nylon string was used to achieve a straight row planting and straight spacing between plants in a row.

Experimental treatments and design. The treatments, consisted of commercial organic fertilizers such as: Bodega (1.0 – 5 –1.0), Farmers Choice (1.2 – 5.7 – 1.4) and D & T (2 - 5 - 4). Plants applied with granular inorganic fertilizer and plants without fertilizer were used as control. The treatments were laid out in a randomized complete block design with each treatment was replicated four times. There were 16 plants per treatment with 4 plants per replication.

Fertilization. The rate of fertilization was based on results of soil analysis which prescribed a recommended rate of 90- 30 –120 kg of N,P_2O_5 and K_2O/ha. The amount of fertilizer was split into two. Half of the fertilizer was applied at planting while the other half was side dressed 1 ½ months after. The first dose was incorporated with the soil just before planting while the remaining fertilizer was applied in a ring 30 cm away from the base of the plant.

Replanting and desuckering. One to two weeks after planting, suckers without functional leaves were replaced with a new one. Four to five weeks after, regular sucker pruning was done. A 1:2 or one mother plant and two follower suckers of similar height, were retained.

Care of plants. Watering of the plants was done whenever needed. When rainfall fell below 5 cm (as shown in the rain gauge), watering was done on a weekly basis to compensate for any deficiency. Uphilling was done as soon as the second dose of fertilizer (1 ½ months of plant age) was applied. This covered the base of the plant and the fertilizer applied. Cartap, a synthetic was spread when aphid infestation occurred. Leaf pruning was done using a pruning knife attached to a pole. This was done by removing and disposing the dried and diseased leaves every week.

Data collected. All the plants were utilized in data collection. Data on days to shooting, yield and neighboring farmer's perception about the research were not obtained

because a typhoon hit the experimental area even before the fifth month data were collected. Only the following data were collected during the conduct of the study:

1. Plant height – Each plant from the different treatments and replication was used for data gathering. Height was measured one week after planting and every month thereafter. This was done by measuring from the base of the plant to the base of the longest leaf using a meter stick.
2. Trunk size – The circumference of the pseudostem or trunk of each plant was measured in centimeters from the largest portion (base of the plant) using a meter tape. This was recorded at monthly interval also at the same time when height measurement was done.
3. Number of functional leaves - A leaf was considered functional if it is well developed, open, green in color and photosynthesizing. The same plants used for measuring plant height and trunk size were also used to count the number of functional leaves. This was taken one week after planting and at monthly interval until the study terminated.

Analysis of data. All data gathered were statistically analyzed using the analysis of variance (ANOVA) for a randomized complete block design. The Duncan's multiple range test was used to determine significant treatment mean differences.

RESULTS AND DISCUSSIONS

Plant height. The height of lacatan bananas for four consecutive months is shown in Table 1. Bananas fertilized with Farmers Choice were the tallest right from the start of the study until its four month growing period having 134.00 cm in height. This was very closely followed by bananas applied with D & T, Bodega and inorganic fertilizer having 133.38, 132.25 and 131.38 cm, respectively. The unfertilized bananas (Treatment E) were consistently the shortest having 285.38, 123.19, 111.25, 118.50 and 123.75cm on its initial, 1st, 2nd, 3rd and the 4th months respectively. Variation in height however, were not statistically different at 5% level of probability. Which show that lacatan bananas fertilized with any organic fertilizer and inorganic fertilizer have comparable heights as the fertilized plants.

The data simply show that lacatan bananas fertilized with inorganic fertilizer, organic fertilizer is as good as not fertilizing at all.

Table 1. Monthly Height of Lacatan Bananas

Treatment	Initial	1 Month	2 Months	3 Months	4 Months
	cm				
A - Inorganic	95.50^{ns}	111.50^{ns}	118.75^{ns}	125.00^{ns}	131.38^{ns}
B - Bodega	108.30	114.58	119.63	126.00	132.25
C - Farmers Choice	109.30	117.00	121.25	126.88	134.00
D - D & T	96.33	111.88	120.75	126.13	133.38
E - Without fertilizer	85.88	109.19	111.25	118.50	123.95

^{ns} Not significant at the 5% level of probability

Trunk size. Data in Table 2 shows that the trunk size of lacatan bananas fertilized with inorganic granular fertilizer were bigger (37.75 cm), followed by bananas applied with Bodega, D & T and Farmer's Choice having 37.00, 36.38 and 36.25 cm, respectively. The smallest were those of the unfertilized bananas having 32.25 cm only. However, difference in sizes did not vary statistically at 5% level of probability. Just like on plant height of lacatan bananas data on trunk size indicate that not using fertilizer is as good as using either organic nor inorganic fertilizer at Ilongbukid condition.

Table 2. Monthly Trunk Size of Lacatan Bananas

Treatment	Initial	1 Month	2 Months	3 Months	4 Months
			cm		
A - Inorganic	32.25^{ns}	33.90^{ns}	34.75^{ns}	35.50^{ns}	37.75^{ns}
B - Bodega	31.65	33.06	34.56	35.25	37.00
C - Farmers Choice	29.65	30.88	32.50	34.25	36.25
D - D & T	27.00	29.50	33.25	35.25	36.38
E - Without fertilizer	28.75	32.38	30.50	31.00	32.25

^{ns} Not significant at the 5% level of probability

Number of functional leaves. The number of functional leaves of lacatan bananas ranged from 1.0 to 1.5, 3.0 to 3.5, 3.0 to 4.5, 3.5 to 4.75 and from 3.75 to 5.25 on the initial measurement and on the first to the fourth month after planting, respectively (Table 3). Statistical analysis revealed that differences among treatment means were only significant ($p<0.05$) on the second and third months. During these periods, bananas applied with inorganic, Bodega and Farmer's Choice fertilizer had significantly ($p<0.5$) more functional leaves than those in the D & T and without fertilizer treatments. It was
observed that this has nothing to do with the experimental treatment for in the D & T and without fertilizer treatment, presence of aphid and other leaf chewing insect, like planthopper infested the plant on the second month and were continuously affecting the plant on the third month. On the fourth month, however, the plants have recovered after these were sprayed with Cartap*, as shown by the non significant variations in the data on the fourth month.

Table 3. Monthly Number of Functional Leaves of Lacatan

Treatment	Initial	1 Month	2 Months	3 Months	4 Months
			cm		
A - Inorganic	1.25 ^{ns}	3.25^{ns}	4.50^{a}	4.75^{a}	5.00^{ns}
B - Bodega	1.25	3.25	4.50^{a}	4.75^{a}	5.25
C - Farmers Choice	1.25	3.25	4.25^{a}	4.50^{a}	5.25
D - D & T	1.5	3.5	3.25^{b}	3.50^{b}	3.75
E - Without fertilizer	1.0	3.0	3.00^{b}	3.50^{b}	4.75

^{ns} Not significant at the 5% level of probability

^{ab} Treatment means followed by different letter superscript are significantly different at the 5% level of probability

SUMMARY, CONCLUSION AND RECOMMENDATION

The study was conducted from February 26 to June 16, 2007 at Ilongbukid, San Rafael, Iloilo. This aimed to determine the growth performance of lacatan bananas fertilized by different brands of organic fertilizer. The treatments were arranged in a randomized complete block design with four replications. The experimental treatments consisted of three organic fertilizers namely: Bodega, Farmer's Choice and D & T compost. Banana applied with granular fertilizer and plant without fertilizer were used as basis for comparison. The rate of fertilizer was based on the recommended rate of 90-30-120 kg of nitrogen, P_2O_5 and K_2O per hectare.

Results of the study revealed that bananas fertilized with Farmer's choice were the tallest on the 4th month study period having 134.00 cm in height. Those unfertilized bananas was understandably the shortest having 123.75 cm in height.

As to their trunk size, lacatan bananas fertilized with inorganic granular fertilizer were bigger having 37.75 cm. The unfertilized bananas were the smallest having 32.25 cm only. Difference in trunk size did not vary significantly at 5% level of probability.

It was during the second and third months of growing period that lacatan bananas fertilized with inorganic, Bodega and Farmers' choice fertilizer had significantly ($p<0.05$) more functional leaves than those in the D & T and without fertilizer treatment. In the fourth month of study period, functional leaves were developed by plants fertilized with Bodega and Farmers' choice. However, difference in functional leaves did not vary significantly at 5% level of probability.

Based on the foregoing results, it is recommended that another study to further verify the result and determine the effect of fertilizer on fruiting and fruit yield be done. The non significant differences on the three banana characteristics gathered inspite the fertilizer recommendation given after soil analysis deserves verification. It is recommended further that lacatan banana sucker must not be planted if they are already on its 3rd or 4th generation especially on hilly and rugged land. Precaution, continuous monitoring and eventual immediate eradication must also be done on *bunchy top*, a dreadful viroid banana disease on areas where history and occurrence of such disease had occurred.

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APPENDIX

Table 4. Initial Height of Lacatan Bananas and its Analysis of Variance

Treatment	Replication				Mean
	I	II	III	IV	
	cm				
A - Inorganic	74.00^{ns}	98.00^{ns}	115.00^{ns}	95.00^{ns}	95.50^{ns}
B - Bodega	120.50	116.00	98.00	91.00	106.38
C - Farmers Choice	108.75	108.00	111.50	109.00	109.31
D - D & T	99.00	102.80	112.50	71.00	96.33
E - Without fertilizer	97.50	104.00	75.00	67.00	85.88

Source of Variation	Degree of Freedom	Sum of Square	Mean Square	Comp F	Tab F 0.05	Tab F 0.01
Replication	3	1057.520	352.507	1.85^{ns}	3.49	5.95
Treatment	4	1407.558	351.889	1.85^{ns}	3.26	5.41
Experimental Error	12	2287.344	190.612			
Total	19	4752.422				

cv = 13.99

^{ns} Not significant at the 5% level of probability

Table 5. Height of Lacatan Bananas One Month after Transplanting and its Analysis of Variance

Treatment	Replication				Mean
	I	II	III	IV	
	cm				
A - Inorganic	96.00^{ns}	112.50^{ns}	126.50^{ns}	111.00^{ns}	111.50^{ns}
B - Bodega	124.00	117.50	105.00	111.00	114.38
C - Farmers Choice	114.50	123.00	112.50	118.00	117.00
D - D & T	105.00	114.50	119.00	109.00	111.88
E - Without fertilizer	124.00	117.00	96.00	99.75	109.19

Source of Variation	Degree of Freedom	Sum of Square	Mean Square	Comp F	Tab F 0.05	Tab F 0.01
Replication	3	135.609	45.203	0.43^{ns}	3.49	5.95
Treatment	4	142.862	35.716	0.34^{ns}	3.26	5.41
Experimental Error	12	1252.688	104.391			
Total	19	1531.159				

cv = 9.06

^{ns} Not significant at the 5% level of probability

Table 6. Height of Lacatan Bananas Two Months After Transplanting and its Analysis of Variance

Treatment	Replication				Mean
	I	II	III	IV	
	cm				
A - Inorganic	114.00^{ns}	115.00^{ns}	129.00 ^{ns}	117.00^{ns}	118.75^{ns}
B - Bodega	130.00	121.00	106.50	121.00	119.63
C - Farmers Choice	115.00	123.00	120.50	126.50	121.25
D - D & T	125.00	114.50	123.00	120.50	120.75
E - Without fertilizer	124.00	117.50	97.50	106.00	111.25

Source of Variation	Degree of Freedom	Sum of Square	Mean Square	Comp F	Tab F 0.05	Tab F 0.01
Replication	3	99.538	33.179	0.45	3.49	5.95
Treatment	4	265.450	66.363	0.91^{ns}	3.25	5.41
Experimental Error	12	879.650	73.304			
Total	19	1244.638				

cv = 7.24

^{ns}Not significant at the 5% level of probability

Table 7. Height of Lacatan Bananas Three Months After Transplanting and its Analysis of Variance

Treatment	Replication				Mean
	I	II	III	IV	
	cm				
A - Inorganic	123.00	118.00	130.00	129.00	125.00^{ns}
B - Bodega	131.50	127.50	118.00	127.00	126.00
C - Farmers Choice	124.00	129.00	128.00	126.50	126.88
D - D & T	133.00	117.50	130.00	124.00	126.13
E - Without fertilizer	130.00	122.00	106.00	116.00	118.50

Source of Variation	Degree of Freedom	Sum of Squares	Mean Squares	Comp F	Tab F 0.05	Tab F 0.01
Replication	3	108.700	36.233	0.80	3.49	5.95
Treatment	4	187.125	46.781	1.03^{ns}	3.26	5.41
Experimental Error	12	545.175	45.431			
Total	19	841.000				

cv = 5.41

^{ns} Not significant at the 5% level of probability

Table 8. Height of Lacatan Bananas Four Months After Transplanting and its Analysis of Variance

Treatment	Replication				Mean
	I	II	III	IV	
	cm				
A - Inorganic	130.00^{ns}	124.50^{ns}	135.00^{ns}	136.00^{ns}	131.38^{ns}
B - Bodega	135.50	134.50	125.00	134.00	132.25
C - Farmers Choice	131.50	134.00	140.00	130.50	134.00
D - D & T	140.00	120.00	138.50	135.00	133.38
E - Without fertilizer	130.00	128.00	112.00	125.00	123.75

Source of Variation	Degree of Freedom	Sum of Square	Mean Square	Comp F	Tab F 0.05	Tab F 0.01
Replication	3	78.050	26.017	0.64	3.49	5.95
Treatment	4	275.575	68.894	1.43^{ns}	3.26	5.41
Experimental Error	12	579.825	48.319			
Total	19	933.450				

cv = 5.31

^{ns} Not significant at the 5% level of probability

Table 9. Trunk Size of Lacatan Bananas One Month After Transplanting and its Analysis of Variance

Treatment	Replication				Mean
	I	II	III	IV	
	cm				
A - Inorganic	29.50^{ns}	33.00^{ns}	35.00^{ns}	31.50^{ns}	32.25^{ns}
B - Bodega	32.00	29.50	33.00	32.00	31.63
C - Farmers Choice	28.50	28.00	33.00	29.00	29.63
D - D & T	24.00	32.00	31.00	21.00	27.00
E - Without fertilizer	30.00	31.50	25.00	26.00	28.13

Source of Variation	Degree of Freedom	Sum of Square	Mean Square	Comp F	Tab F 0.05	Tab F 0.01
Replication	3	40.737	13.579	1.44^{ns}	3.49	5.95
Treatment	4	79.925	19.981	2.12^{ns}	3.26	5.41
Experimental Error	12	113.075	9.423			
Total	19	233.737				

cv = 10.33

^{ns} Not significant at the 5% level of probability

Table 10. Trunk Size of Lacatan Bananas Two Months After Transplanting and its Analysis of Variance

Treatment	Replication				Mean
	I	II	III	IV	
	cm				
A - Inorganic	33.00^{ns}	34.30^{ns}	35.50^{ns}	32.00^{ns}	33.70^{ns}
B - Bodega	34.25	34.00	33.50	32.50	33.56
C - Farmers Choice	30.00	29.50	34.00	30.00	30.88
D - D & T	27.00	33.00	32.00	26.00	29.50
E - Without fertilizer	32.00	33.00	25.50	39.00	32.38

Source of Variation	Degree of Freedom	Sum of Square	Mean Square	Comp F	Tab F 0.05	Tab F 0.01
Replication	3	5.800	1.933	0.16^{ns}	3.49	5.95
Treatment	4	51.951	12.988	1.08^{ns}	3.26	5.41
Experimental Error	12	144.851				
Total	19	202.602	12.071			

cv = 10.86

^{ns} Not significant at the 5% level of probability

Table 11. Trunk Size of Lacatan Bananas Two Months After Transplanting and its Analysis of Variance

Treatment	Replication				Mean
	I	II	III	IV	
	cm				
A - Inorganic	35.00^{ns}	35.00^{ns}	36.00^{ns}	33.00^{ns}	34.75^{ns}
B - Bodega	34.50	35.00	35.00	33.75	34.56
C - Farmers Choice	31.00	33.50	35.00	30.50	32.50
D - D & T	38.00	33.00	33.00	29.00	33.25
E - Without fertilizer	33.00	35.00	25.00	29.00	30.50

Source of Variation	Degree of Freedom	Sum of Square	Mean Square	Comp F	Tab F 0.05	Tab F 0.01
Replication	3	35.859	11.953	1.72^{ns}	3.49	5.95
Treatment	4	48.013	12.003	1.73^{ns}	3.25	5.41
Experimental Error	12	83.188	6.932			
Total	19	167.059				

cv = 7.95

^{ns} Not significant at the 5% level of probability

Table 12. Third Month Trunk Size of Lacatan Bananas and its Analysis of Variance.

Treatment	Replication				Mean
	I	II	III	IV	
	cm				
A - Inorganic	35.00^{ns}	3500 ^{ns}	38.00^{ns}	35.00^{ns}	35.50^{ns}
B - Bodega	35.00	35.00	36.00	35.00	35.25
C - Farmers Choice	32.00	38.00	36.00	31.00	34.25
D - D & T	42.00	33.00	35.00	31.00	35.25
E - Without fertilizer	33.50	36.50	25.00	29.00	31.00

Source of Variation	Degree of Freedom	Sum of Square	Mean Square	Comp F	Tab F 0.05	Tab F 0.01
Replication	3	41.250	13.750	1.13^{ns}	3.49	5.95
Treatment	4	56.500	14.125	1.16^{ns}	3.26	5.41
Experimental Error	12	146.500	12.208			
Total	19	244.250				

cv = 10.20

^{ns} Not significant at the 5% level of probability

Table 13. Trunk Size of Lacatan Bananas Four Months After Transplanting and its Analysis of Variance

Treatment	Replication				Mean
	I	II	III	IV	
	cm				
A - Inorganic	39.00^{ns}	36.00^{ns}	39.00^{ns}	37.00^{ns}	37.75^{ns}
B - Bodega	38.00	36.00	38.00	36.00	37.00
C - Farmers Choice	34.00	43.00	37.00	31.00	36.25
D - D & T	43.00	33.00	36.50	33.00	36.38
E - Without fertilizer	35.00	40.00	25.00	29.00	32.25

Source of Variation	Degree of Freedom	Sum of Square	Mean Square	Comp F	Tab F 0.05	Tab F 0.01
Replication	3	72.138	24.046	1.34^{ns}	3.49	5.95
Treatment	4	73.200	18.300	1.02^{ns}	3.26	5.41
Experimental Error	12	214.800	17.900			
Total	19	360.138				

cv = 11.78

^{ns} Not significant at the 5% level of probability

Table 14. Initial Number of Functional Leaves of Lacatan Bananas and its Analysis of Variance.

Treatment	Replication				Mean
	I	II	III	IV	
	cm				
A - Inorganic	1.00^{ns}	1.00^{ns}	1.00^{ns}	2.00^{ns}	1.25^{ns}
B - Bodega	1.00	1.00	2.00	1.00	1.25
C - Farmers Choice	1.00	1.00	2.00	1.00	1.25
D - D & T	2.00	2.00	1.00	1.00	1.50
E - Without fertilizer	1.00	1.00	1.00	1.00	1.00

Source of Variation	Degree of Freedom	Sum of Square	Mean Square	Comp F	Tab F	
					0.05	0.01
Replication	3	0.150	0.050	0.19^{ns}	3.49	5.95
Treatment	4	0.500	0.125	0.48^{ns}	3.26	5.41
Experimental Error	12	3.100	0.258			
Total	19	3.750				

cv = 40.66

^{ns} Not significant at the 5% level of probability

Table 15. Number of Functional Leaves of Lacatan Bananas One Month After Transplanting and its Analysis of Variance

Treatment	Replication				Mean
	I	II	III	IV	
	cm				
A - Inorganic	3.00^{ns}	3.00^{ns}	3.00^{ns}	4.00^{ns}	3.25^{ns}
B - Bodega	3.00	3.00	4.00	3.00	3.25
C - Farmers Choice	3.00	3.00	4.00	3.00	3.25
D - D & T	4.00	4.00	3.00	3.00	3.50
E - Without fertilizer	3.00	3.00	3.00	3.00	3.00

Source of Variation	Degree of Freedom	Sum of Square	Mean Square	Comp F	Tab F	
					0.05	0.01
Replication	3	0.150	0.050	0.19^{ns}	3.49	5.95
Treatment	4	0.500	0.125	0.48^{ns}	3.26	5.41
Experimental Error	12	3.100	0.258			
Total	19	3.750				

cv = 9.06

^{ns} Not significant at the 5% level of probability

Table 16. Number of Functional Leaves of Lacatan Bananas Two Months After Transplanting and its Analysis of Variance

Treatment	Replication				Mean
	I	II	III	IV	
	cm				
A - Inorganic	4.00	5.00	4.00	5.00	4.50[a]
B - Bodega	4.00	5.00	5.00	4.00	4.50[a]
C - Farmers Choice	4.00	5.00	5.00	3.00	4.25[a]
D - D & T	3.00	4.00	3.00	3.00	3.25[b]
E - Without fertilizer	4.00	2.00	3.00	3.00	3.00[b]

Source of Variation	Degree of Freedom	Sum of Square	Mean Square	Comp F	Tab F 0.05	Tab F 0.01
Replication	3	1.000	0.333	0.62[ns]	3.49	5.95
Treatment	4	8.300	2.075	3.83*	3.26	5.41
Experimental Error	12	6.500	0.542			
Total	19	15.800				

cv =18.87

[ns] Not significant at the 5% level of probability

*Significant at the 5% level of probability

Table 17. Number of Functional Leaves of Lacatan Bananas Three Months After Transplanting and its Analysis of Variance

Treatment	Replication				Mean
	I	II	III	IV	
	cm				
A - Inorganic	4.00[ns]	5.00[ns]	5.00[ns]	5.00[ns]	4.75[a]
B - Bodega	5.00	5.00	5.00	4.00	4.75[a]
C - Farmers Choice	4.00	5.00	6.00	3.00	4.50[a]
D - D & T	3.00	4.00	4.00	3.00	3.50[b]
E - Without fertilizer	4.00	4.00	3.00	3.00	3.50[b]

Source of Variation	Degree of Freedom	Sum of Square	Mean Square	Comp F	Tab F 0.05	Tab F 0.01
Replication	3	3.600	1.200	2.94	3.49	5.95
Treatment	4	6.700	1.675	4.10	3.26	5.41
Experimental Error	12	4.900	0.408			
Total	19	15.200				

cv = 15.21

[ab] Significant at 5% level of probability

Table 18. Number of Functional Leaves of Lacatan Bananas Four Months After Transplanting and its Analysis of Variance

Treatment	[a]				Mean
	I	II	III	IV	
	cm				
A - Inorganic	4.00[ns]	5.00[ns]	6.00[ns]	5.00[ns]	5.00[ns]
B - Bodega	5.00	5.00	5.00	6.00	5.25
C - Farmers Choice	5.00	6.00	7.00	3.00	5.25
D - D & T	3.00	4.00	5.00	3.00	3.75
E - Without fertilizer	5.00	5.00	6.00	3.00	4.75

Source of Variation	Degree of Freedom	Sum of Square	Mean Square	Comp F	Tab F	
					0.05	0.01
Replication	3	9.200	3.067	3.76*	3.49	5.95
Treatment	4	6.200	1.550	1.90[ns]	3.26	5.41
Experimental Error	12	9.800	0.817			
Total	19	25.200				

cv = 18.83

[ns] Not significant at the 5% level of probability