

HYFER PLUS FOLIAR FERTILIZER EFFICACY TEST ON PINEAPPLE

INTRODUCTION

Pineapple scientifically known as *Ananas comosus* is a perennial herb with multiple fruit and the only common food plant in the Bromeliaceae. It is commonly grown in the Philippines, the country being the second world producer of pineapple. Large scale pineapple production is in Bukidnon, Cotabato and its neighboring areas. Negros Occidental and other provinces is on its baby, all in the effort to break from the sugarcane monocropping system.

Hyfer Plus Foliar Fertilizer is a fertilizer of high quality developed by AGROTIGER Philippine Corporation. The product is a unique blend of properly balanced macroelements (22% Nitrogen, 11% Phosphorous, 9% Potassium) chelated micronutrients and spreader sticker. It promotes early root development chlorophyll formation and increase plant resistance to pests and diseases. It helps plants cope-up stress conditions during transplanting, temporary water scarcity, and other adverse conditions.

As a foliar feed, the product is easily utilized by the plant through stomates and epidermis and nutrients are immediately distributed to the different parts of the plant, eventually boost flavors, sweetness, and increase in yield.

OBJECTIVES

In order for HYFER PLUS FOLIAR FERTILIZER be granted permission for label expansion on pineapple by the Fertilizer and Pesticide Authority (FPA), the AGROTIGER Philippine Corporation would like to;

- a. Study the effects of HYFER PLUS FOLIAR FERTILIZER application on the average fruit circumference, average fruit length, average weight of the fruit, and average yield per hectare of queen variety of pineapple.

SITE DESCRIPTION

The experimental site is located in Brgy. Tinampaan, Cadiz City 63 kilometers away from Bacolod City, going north of Negros Occidental. The place is almost kilometers away from the national road, and adjacent to the biggest Solar Plant in the country. The place has two pronounced seasons, the wet and dry. The dry season is from late December to early parts of May. Rainy season starts in June reaches its peak in September and ends in October. The area is bound by Himogaan river on its western side which is the source of irrigation water the whole year round for the growing of rice and other cash crops. The site is provided with small canals that empties extra water to Himogaan River. Precipitation is the lowest in April, with an average of 63mm. In October, the precipitation reaches its peak, with an average of 298mm. At an average temperature of 28.7 degrees Celsius, May is the hottest month of the year. At 26.0 degrees Celsius on average, January is the coldest month of the year.

SELECTION OF CROP VARIETY

The Queen Pineapple Variety was used in the study. The fruits are spiny, golden yellow in color, and emit pleasant aroma or flavor at the ripening stage. The average weight is from 6.00 to 8.00 grams and the water content is 80%-90%.

TIME OF STUDY

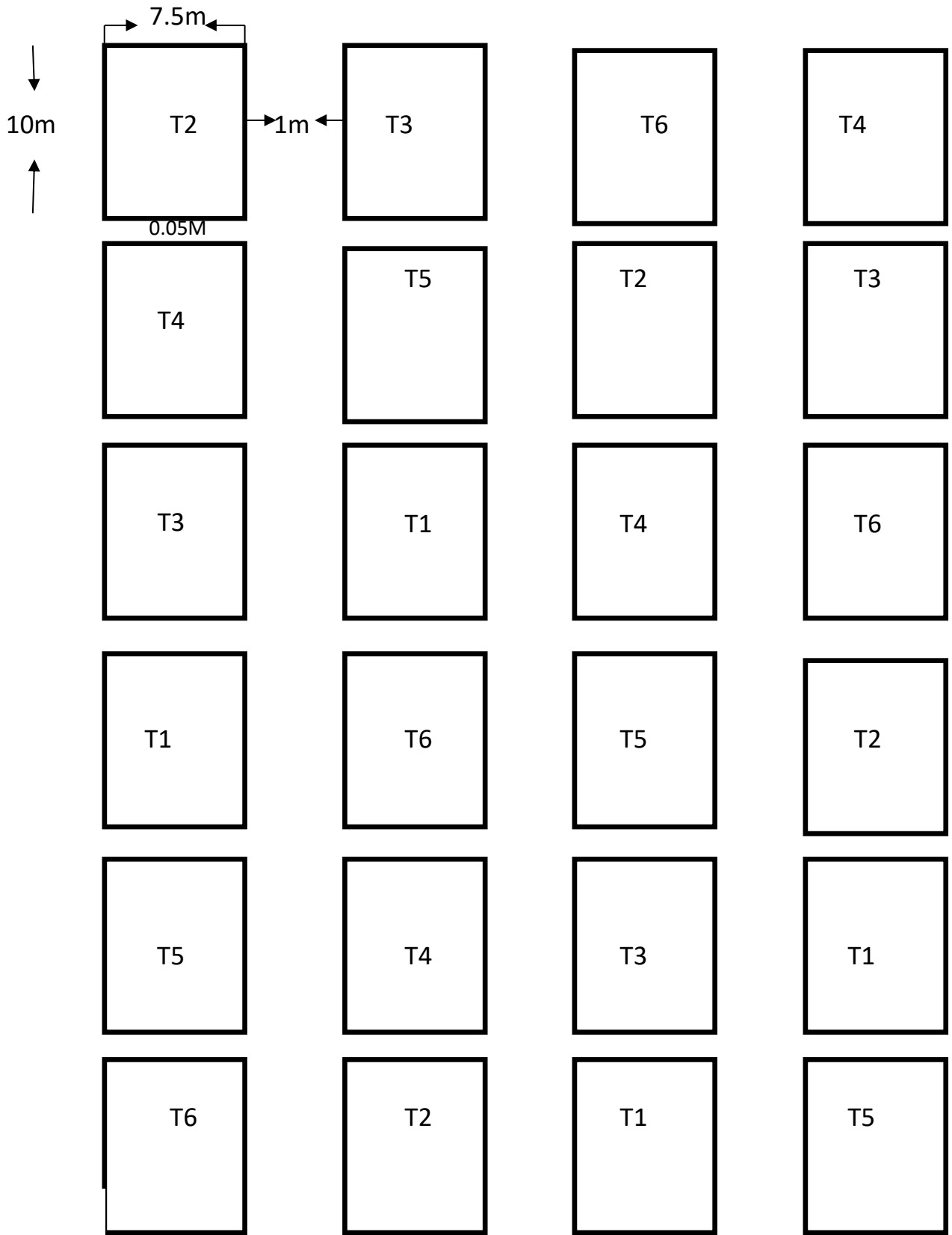
The field research began August 2020 and ended last April 2021.

RESEARCH DESIGN AND EXPERIMENTAL LAY-OUT

An area of approximately 2,000 square meters was laid out using a Randomized Complete Block Design (RCBD). The area was divided into 4 blocks. Each block had 1 meter space that will separate one another 0.5 meter space between plots.

LAY-OUT

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Fig. 1 Experimental Lay-out

TREATMENTS

The following treatments was used in the study;

T1 – Control

T2 – 280-170-300 kg/ha of NPK

T3 – 140-85-150 kg/ha of NPK

T4 – 140-85-150 kg/ha of NPK + 2 L/ha of HYFER PLUS FOLIAR FERTILIZER

T5 – 2 L/ha of HYFER PLUS FOLIAR FERTILIZER

T6 – 280-170-300 kg/ha + 2 L/ha of HYFER PLUS FOLIAR FERTILIZER

LAND PREPARATION

The experimental site was prepared thoroughly by deep plowing using a mold boarder plow to loosen the soil and was harrowed 2 or 3 times until a fine tilth was reached. A well prepared soil will have a good soil structure and even can control weeds.

PLANTING

Healthy suckers were used as planting material a distance of 10 inches between rows. A double row planting was employed a planting depth of 5 inches in upright position for a proper rooting

FERTILIZATION

Fertilization application was based according to assigned treatments. Conventional fertilizer will be applied 6, 10, 17, 25, 33, 39, 49, and 58 week after planting. Hyfer Plus Foliar Fertilizer was applied as foliar spray 6 weeks after planting and a month thereafter until the 15 month after planting.

Treatments	Description	Product	Rate	Timing of Application
T1	Control			
T2	280-170-300 kg/ha of NPK	Inorganic Fertilizer	280-170-300	From 6 th week to 58 th WAP
T3	140-85-150 kg/ha of NPK	Inorganic Fertilizer	140-85-150	From 6 th week to 58 th WAP
T4	140-85-150 kg/ha of NPK + 2 L/ha of HYFER PLUS FOLIAR FERTILIZER	Inorganic Fertilizer + Hyfer Plus Foliar Fertilizer	140-85-150 2 L	From 6 th week to 58 th WAP 8 th MAP to 14 th MAP
T5	2 L/ha of HYFER PLUS FOLIAR FERTILIZER	Hyfer Plus Foliar Fertilizer	2 L	8 th MAP to 14 th MAP
T6	280-170-300 kg/ha + 2 L/ha of HYFER PLUS FOLIAR FERTILIZER	Inorganic Fertilizer + Hyfer Plus Foliar Fertilizer	280-170-300 2 L	6 th MAP up to 58 th MAP 8 th MAP to 14 th MAP

WEEDING

Manual weeding was done every 28 days. Weeds will be uprooted from the soil, then will be brought outside the blocks and piled in the block roads to ensure sanitation and prevent regrowth of weeds.

WATER MANAGEMENT

The area was equipped with irrigation facilities that can support the field experiment during dry spell. In case of excess water, the site was surrounded by small canals that served as outlet of water to drain the field.

PEST AND DISEASES CONTROL

Pest and diseases incidence was closely monitored. Sanitation of the surroundings was strictly implemented to prevent the entrance of pests and diseases. Pesticide and other chemicals were used to drive away pests and control diseases.

HARVESTING

Pineapple was ready for harvest 18 months after planting. Indications like eye shows a light pale green to yellow color sign – on that the plant is already mature. Handpicking the fruits will be done by breaking or cutting the stalk a few centimeters below the fruit and be placed on crates to prevent fruit damage.

GATHERING OF DATA

Average Fruit Length (cm) – this was done by measuring the fruit from the base to its tip using a tape measure.

Average Fruit Girth (cm) – this was measured by getting the circumference using a tape measure.

Average Fruit Weight (kg) – this was taken by weighing the individual fruit of 20 representative fruit samples and computed for the average weight per fruit.

Average Yield (tons/ha) – this was done by weighing the fruits per treatment in all plots and all converted into tons per hectare.

STATISTICAL ANALYSIS

Yield data that were generated will be analyzed using the Analysis of Variance (ANOVA) for Randomized Complete Block Design (RCBD). Least Significance Difference Test (LSDT) will be used to test the level of significance among treatments means

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RESULTS AND DISCUSSION

Table 1. Summary of Means on the Number of Fruit Weight, Fruit Diameter, Fruit Length, and Average Yield applied with HPBB

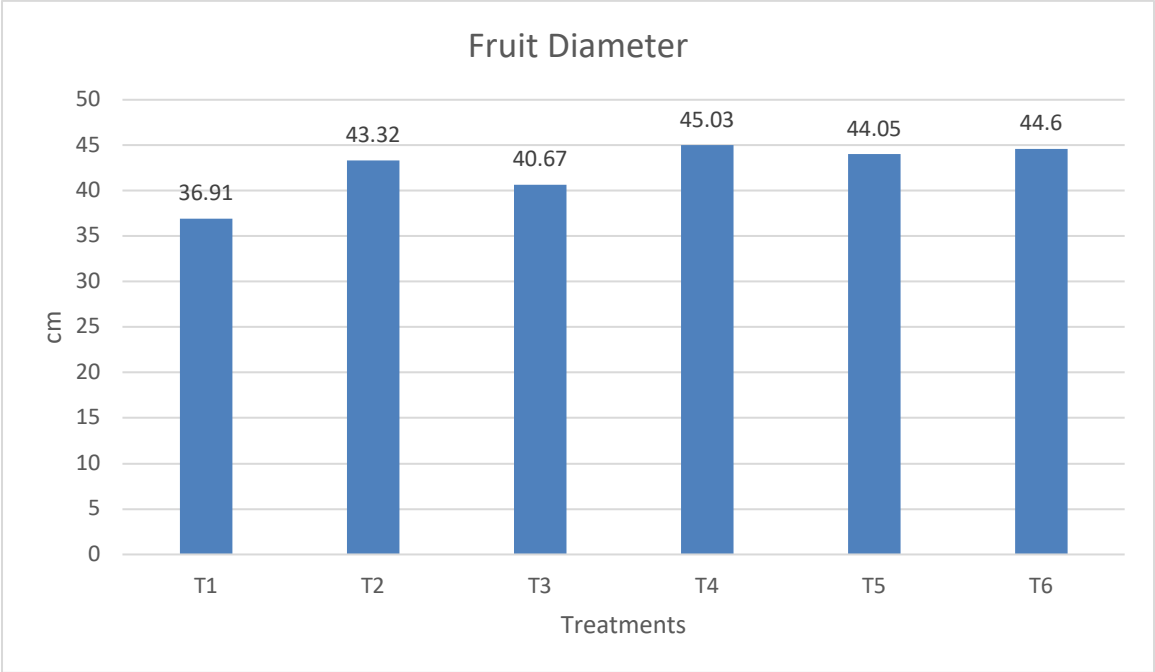
Treatments	Fruit Diameter (cm)	Fruit Length (cm)	Number of Fruit Weight(kg)	Average Yield(tons/ha)
1	36.91d	15.78c	1.48c	42.86e
2	43.32b	1.97a	2.18b	59.91b
3	40.67c	16.86b	1.53c	50.25d
4	45.03a	19.24a	2.33a	62.22ab
5	44.05ab	18.85a	2.25ab	56.44c
6	44.60ab	19.27a	2.35a	63.67a
Pr				
CV (%)	2.03%	1.84%	3.12%	3.35%

Average Fruit Diameter(cm)

The biggest fruit diameter was 45.03 centimeter measure from plots fertilized with (2) liters per hectare of Hyfer Plus Foliar Fertilizer(T4), significantly bigger by 4.36 centimeter over plants fertilized with 140-85-150 kilograms per hectare of NPK (T3) alone.

The use of 280-170-300 kilograms per hectare of NPK plus 2 liters per hectare of Hyfer Plus Foliar Fertilizer(T6), obtained an average fruit diameter of 44-60 centimeters, significantly better by 1.28 centimeters against pineapple fruit harvested from area fertilized with 280-170-300 kilograms per hectare NPK(T2) alone. The latter treatment registered an average fruit

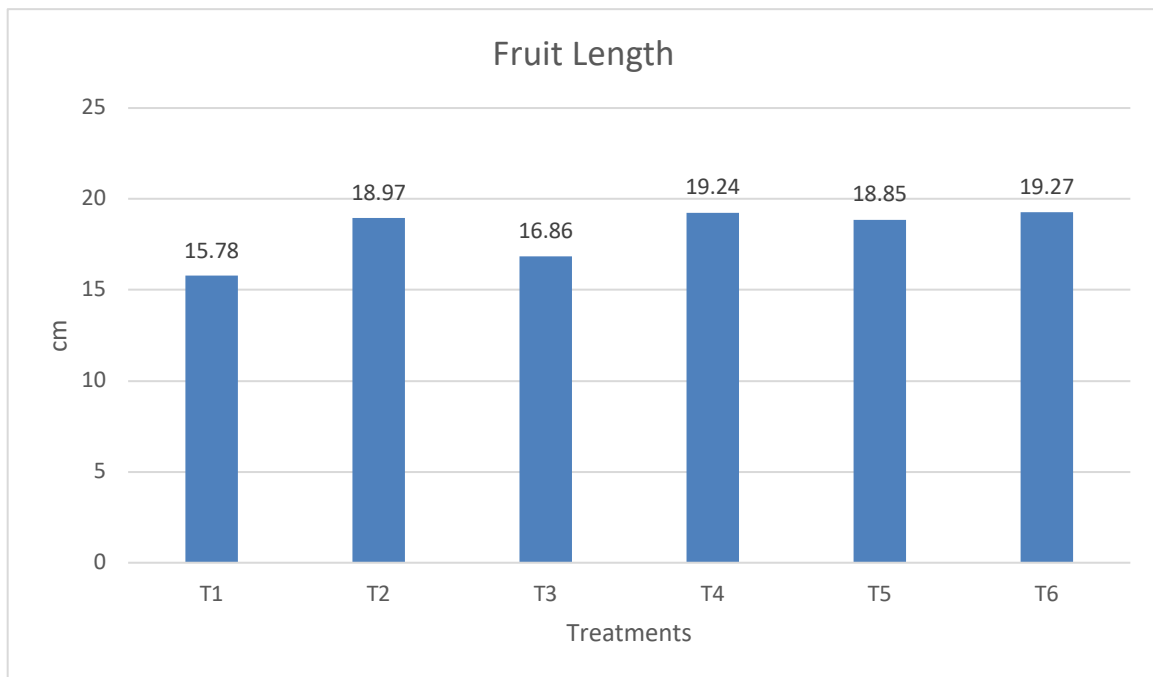
diameter of 43.32 centimeters. The smallest fruit was taken from unfertilized plants(T1) with an average diameter of 36.91 centimeter.



Average Fruit Length(cm)

There was no significant difference in the average fruit length of pineapples harvested from T2, T4, T5, T6 plots, the average length ranged from 18.97 to 19.27 centimeters. Fruits from rows fertilized with 140-85-150 kilogram per hectare of inorganic fertilizers plus 2 liters per hectare of Hyfer Plus Foliar Fertilizer showed an average fruit length of 19.24 centimeters, significantly longer by 2.38 centimeters compared to plants fertilized with 140-85-150 kilogram per hectare of NPK(T3) alone.

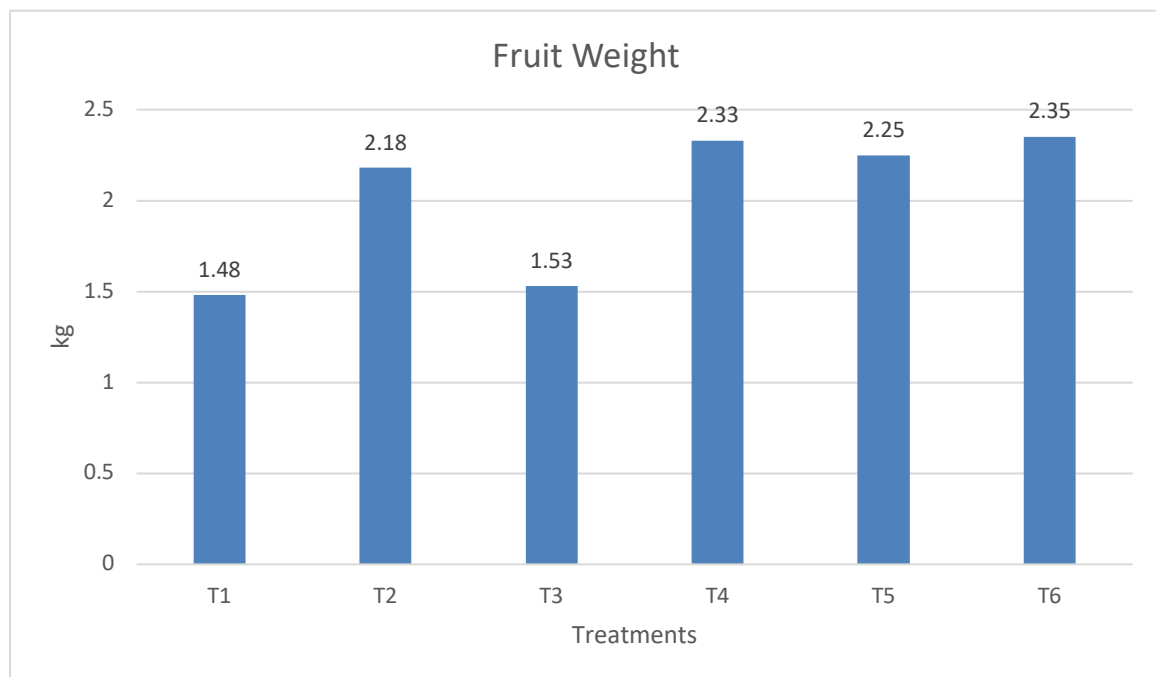
Among the treatment means, the lowest was 15.78 centimeters, measured from the control rows.



Average Fruit Weight(kg)

The full doze or half doze of inorganic fertilizers plus Hyfer Plus Foliar Fertilizer showed any significant influence of in the average fruit weight which registered 2.35 and 2.33 kilograms respectively. Plants applied with 140-85-150 kilograms of NPK(T3) showed a significantly inferior fruit weight of 0.80 kilograms against those applied with the same amount of inorganic fertilizers plus 2 liters per hectare of Hyfer Plus Foliar Fertilizer.

The spraying of 2 liters per hectare Hyfer Plus Foliar Fertilizer(T5) showed a remarkable fruit weight advantage of 0.77 kilogram over plants fruit taken from control rows.

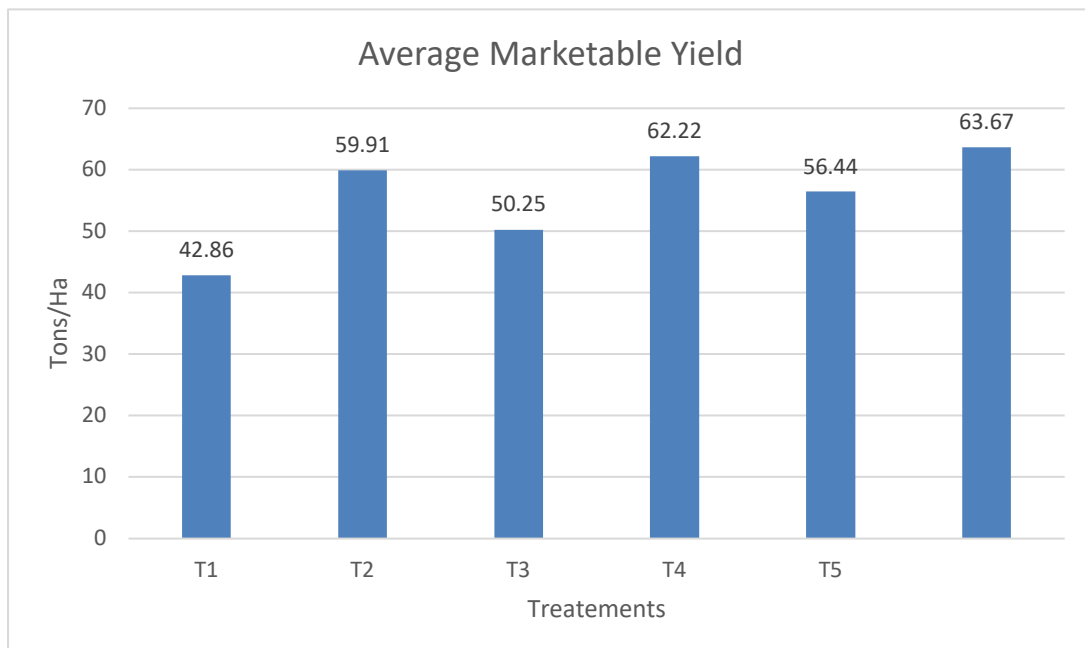


Average Yield/Ha(Tons/ha)

Pineapple fruits grown in rows treated with 250-170-300 kilograms per hectare of NPK in combination with 2 liters per hectare of Hyfer Plus Foliar Fertilizer recorded an average yield of 63.67 tons per hectare, significantly superior by 3.76 tons per hectare compared to fruits weighed from area fertilized with 250-170-300 kilograms per hectare of NPK(T2) alone. T2 plants recorded an average yield of 59.91 tons per hectare

The use of 140-85-150 kilograms per hectare of NPK and 2 liters per hectare of Hyfer Plus Foliar Fertilizer(T4) exhibited an average yield of 62.52 tons per hectare, remarkably better by 12.27 tons per hectare compared to plants applied with 140-85-150 kilograms per hectare of NPK(T3) alone.

Unfertilized plants recorded an average yield of 42.86 tons per hectare, significantly inferior by 13.58 tons against fruits harvested from plots applied with 2 liters per hectare from plots applied with 2 liters per hectare of Hyfer Plus Foliar Fertilizer(T5).



Conclusion and Recommendation

The use of Hyfer Plus Foliar Fertilizer alone, the application of the same combination with full dose or half-dose of inorganic fertilizer based on soil analysis showed a remarkable influence in the average fruit length, average fruit diameter, average fruit weight and average yield of Queen pineapple variety.

Based on the findings, therefore, the use of Hyfer Plus Foliar Fertilizer is highly recommended in the growing of pineapple.

Appendices

Appendix Table 1. Number of Fruit Weight (kg) HPFF

Treatment	Replication			Total	Mean
	I	II	III		
1	1.52	1.48	1.43	4.43	1.48c
2	2.10	2.25	2.18	6.53	2.18b
3	1.58	1.50	1.51	4.59	1.53c
4	2.35	2.40	2.25	7.00	2.33a
5	2.25	2.30	2.20	6.75	2.25ab
6	2.30	2.50	2.25	7.05	2.35a
Total	12.10	12.43	11.82		
Grand Total					
Grand Mean					

Appendix Table 1a. Analysis of variance on number of Number of Fruit Weight (kg) HPFF

Sources of variance	Degrees of freedom	Sums of squares	Means squares	F Value	Pr > F
Rep	2	2.45949444	0.49189889	123.83	<.0001
Trt	5	0.03107778	0.01553889	3.91	0.0556
Error	10	0.03972222	0.00397222		
Total	17	2.53029444			

CV= 3.12%

Appendix Table 2. Average Fruit Diameter (cm) HPFF

Treatment	Replication			Total	Mean
	I	II	III		
1	35.30	38.25	37.10	110.65	36.91d
2	43.50	42.90	43.50	129.90	43.32b
3	40.50	41.25	40.25	122.00	40.67c
4	45.10	45.25	44.75	135.10	45.03a
5	44.20	43.75	44.20	132.15	44.05ab
6	45.60	44.90	45.30	135.80	44.60ab
Total	254.20	256.30	255.10		
Grand Total					
Grand Mean					

Appendix Table 2a. Analysis of variance on average fruit diameter (cm) HPBB

Sources of variance	Degrees of freedom	Sums of squares	Means squares	F Value	Pr > F
Rep	2	145.4474667	29.0894933	38.90	<.0001
Trt	5	0.8368000	0.4184000	0.56	0.5884
Error	10	7.4785333	0.7478533		
Total	17	153.7628000			

CV= 2.03%

Appendix Table 3. Average Fruit Length (cm) HPFF

Treatment	Replication			Total	Mean
	I	II	III		
1	16.10	15.50	15.75	47.35	15.78c
2	18.50	19.10	19.25	56.85	18.97a
3	17.12	17.25	16.20	50.57	16.86b
4	19.32	19.16	19.25	57.73	19.24a
5	19.10	18.75	18.70	56.55	18.85a
6	19.50	19.20	19.10	57.80	19.27a
Total	109.64	108.96	108.25		
Grand Total					
Grand Mean					

Appendix Table 3a. Analysis of variance on Average Fruit Length (cm) HPFF

Sources of variance	Degrees of freedom	Sums of squares	Means squares	F Value	Pr > F
Rep	2	32.63318333	6.52663667	58.29	<.0001
Trt	5	0.17523333	0.08761667	0.78	0.4833
Error	10	1.11963333	0.11196333		
Total	17	33.92805000			

CV= 1.84%

Appendix Table 4. Average Yield(tons/ha) HPFF

Treatment	Replication			Total	Mean
	I	II	III		
1	45.25	40.20	43.12	128.57	42.86e
2	58.10	60.30	61.32	179.72	59.91b
3	50.25	48.20	52.30	150.75	50.25d
4	62.70	63.10	61.75	187.55	62.22ab
5	55.36	54.35	59.60	169.31	56.44c
6	63.70	64.50	62.80	191.00	63.67a
Total	335.36	330.65	340.89		
Grand Total					
Grand Mean					

Appendix Table 4a. Analysis of variance on Average Yield(tons/ha) HPFF

Sources of variance	Degrees of freedom	Sums of squares	Means squares	F Value	Pr > F
Rep	2	967.4542444	193.4908489	53.98	<.0001
Trt	5	8.7568111	4.3784056	1.22	0.3353
Error	10	35.848122	3.584812		
Total	17	1012.059178			

CV= 3.38%