

**THE EFFICACY OF HYFER UREA MAX FERTILIZER
ON THE YIELD OF OIL PALM**

INTRODUCTION

Oil palm plantation in the Philippines began late 60's. Importation of oil palm is high due to shortfall of supply while experiencing increase in domestic demands. Fertilizer management constitutes the largest field cost where 85% or more of this production cost goes into the purchase of fertilizers alone on item in well-run oil palm plantations (Goh, K.J. 2010). The more advanced group adapt the new technologies for better yield these however, require more expensive inputs.

Hyfer Urea Max Fertilizer is one of the many fertilizers, which contain high grade of nitrogen combined with humic acid and mycorrhiza required by most crops for balanced plant nutrition. The blend buffers the effect of urea on soil ammonia oxidizers and potential nitrification thereby increasing the fertilizer nitrogen use. This study is specifically conducted to evaluate the effectiveness of Hyfer Urea Max Fertilizer on the yield of oil palm.

OBJECTIVES

1. For label expansion purposes, Agrotiger Phil. Corporation in coordination with Fertilizer and Pesticide Authority would like to:
 - a. Study the effects of Hyfer Urea Max Fertilizer on the yield of oil palm trees as so as to suffice the requirement for label expansion.

MATERIALS AND METHODS

a. Site Description

- Location - Bangcud, Malaybalay City
- Soil Type - Adtuyon clay loam
- Topography - Plain to slightly sloping (0-5% slope)

b. Description of New Fertilizer Materials and Standard

New Fertilizer Material - Hyfer Urea Max Fertilizer with fertilizer analysis of 46% N, 1% Humic Acid and Mycorrhiza

Standard - 108-74-309 kgs NPK/ha

c. Variety and Distance of Planting

- Variety - Tenera
- Distance of transplanting - 5 year-old tree at flowering & fruiting stages were used in the experiment

d. Experimental Design and Plot Size

- Experimental Design - Randomized Complete Block Design (RCBD)
- Treatment Plot Size - 6 trees per treatment per replication
- Number of replications - 4 replications
- Number of Treatments - 6 treatments (randomized per replication)
- Statistical Analysis - ANOVA using CropSTAT for Windows

e. Treatments

Treatments are as follows:

- T1 - Control (no fertilizer)
- T2 - 108-74-309 kg NPK/ha or 804 g/tree/yr (Recommended Rate of Inorganic Fertilizer) based on soil analysis
- T3 - 54-37-154.5 kg NPK/ha or 402 g/tree /yr (1/2 RR)
- T4 - 54-37-154.5 kg NPK/ha or 402 g/tree /yr (1/2 RR) + 250 g/tree of Hyfer Urea Max Fertilizer (Recommended Rate Of New Fertilizer - RRNF)
- T5 - 250 g/tree of Hyfer Urea Max Fertilizer

(Recommended Rate of New Fertilizer - RRNF)

T6 - 108-74-309 kg NPK/ha or 804 g/tree/yr (Recommended Rate of Inorganic Fertilizer) + 250 g/tree of Hyfer Urea Max Fertilizer (Recommended Rate of New Fertilizer - RRNF)

f. Cultural Management Practices - Mode, Type, Amount and Time

- Application of Hyfer Urea max Fertilizer

The required amount of Hyfer Urea max Fertilizer was 250 g/tree to be applied on the ground. For an efficient result dig the ground 1 meter around the base of the palm oil tree at about ½ foot deep and evenly applied the fertilizer. Covered with soil to avoid run-off.

- Application of Inorganic Fertilizer and Hyfer Urea Max Fertilizer

The sources of nutrients (N, P₂O₅ and K₂O) were Triple Super Phosphate (TSP) (0-46-0), urea (46-0-0), and muriate of potash (0-0-60) fertilizers. In T2 the total amount of TSP was 74g/tree/year, urea 215 g/tree/year, and muriate of potash 515g/tree/year. In T3 and T4 the total amount of TSP was 37g/tree/year, urea 107.5 g/tree/year, and muriate of potash 257.5g/tree/year. In T6 the amount of TSP was 74 g/tree/yr and urea was 215g/tree/yr. Application of fertilizers were done at monthly interval (3 times) from flowering stage until harvest. Oil Palm Trees were applied with 250 grams Hyfer Urea Max per tree for 3 consecutive months during the flowering stage until a month before harvest.

- Maintenance and Other Cultural Management

Trees were maintained as to ring weeding every month or when deemed necessary. Removal of dried and disease leaves was done regularly to keep the area clean and free from invasion of pests and diseases.

- Pests and diseases

Lannate and Dithane were used throughout the plant growing cycle to keep the pests and diseases under control. Application was done at monthly interval to keep the area free from pests and diseases.

- Harvesting

Harvesting was done when numbers of mature fruit can be separated from bunches using low dodos and escalates or bamboo spear on knife-edges.

- Parameters to be gathered

1. Number of bunches per tree – It was done by counting the branches to be harvested.
2. Weight of bunches per tree -Weight of the bunches was recorded and converted to average yield/ha in tons.

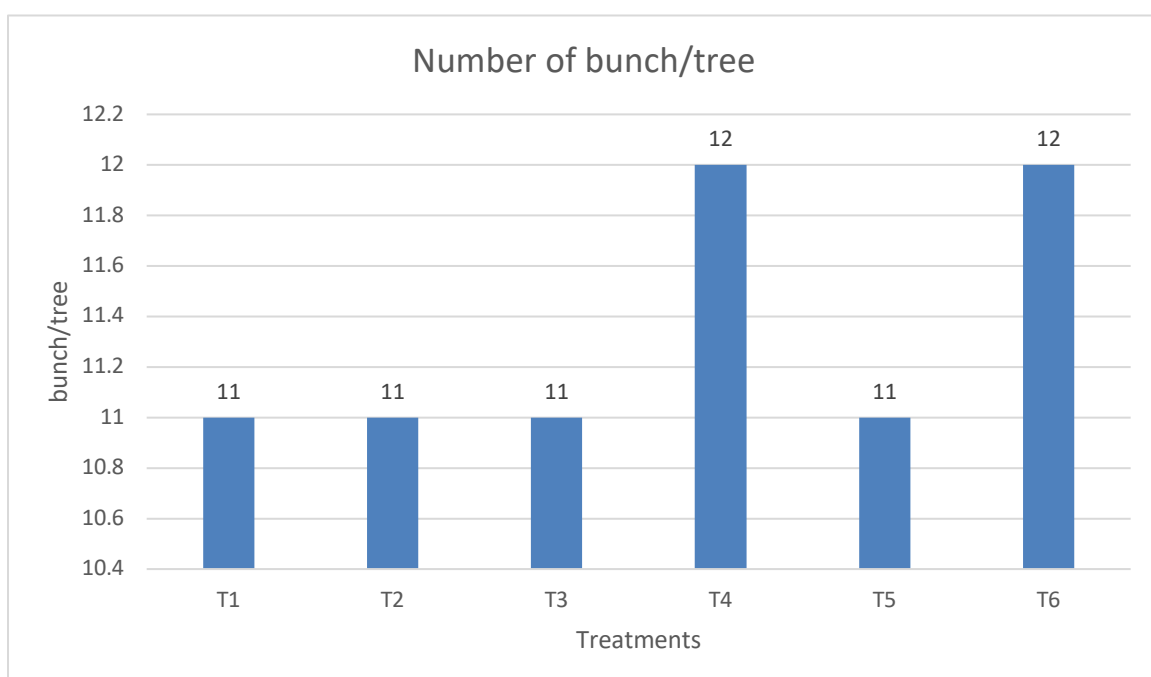
Results and Discussion

Table 1. Summary of Means on the Number of

Treatments	Number of bunches	Weight of First Harvest (kgs)	Weight or Second Harvest (kgs)	Total Weight of 1 st and 2 nd Harvest	Average Yield(tons/h a)
1	11a	34.78e	34.14d	68.93e	9.65e
2	11a	48.00b	47.87b	95.87b	13.42b
3	11a	38.72d	38.72d	77.44d	10.84d
4	12a	43.31c	44.68c	87.99c	12.32c
5	11a	37.99d	38.48d	76.47d	10.71d
6	12a	55.48a	55.48a	110.96a	15.53a
Pr					
CV (%)	3.50%	4.90%	4.70%	4.90%	4.90%

Average number of Bunches/Tree(pcs)

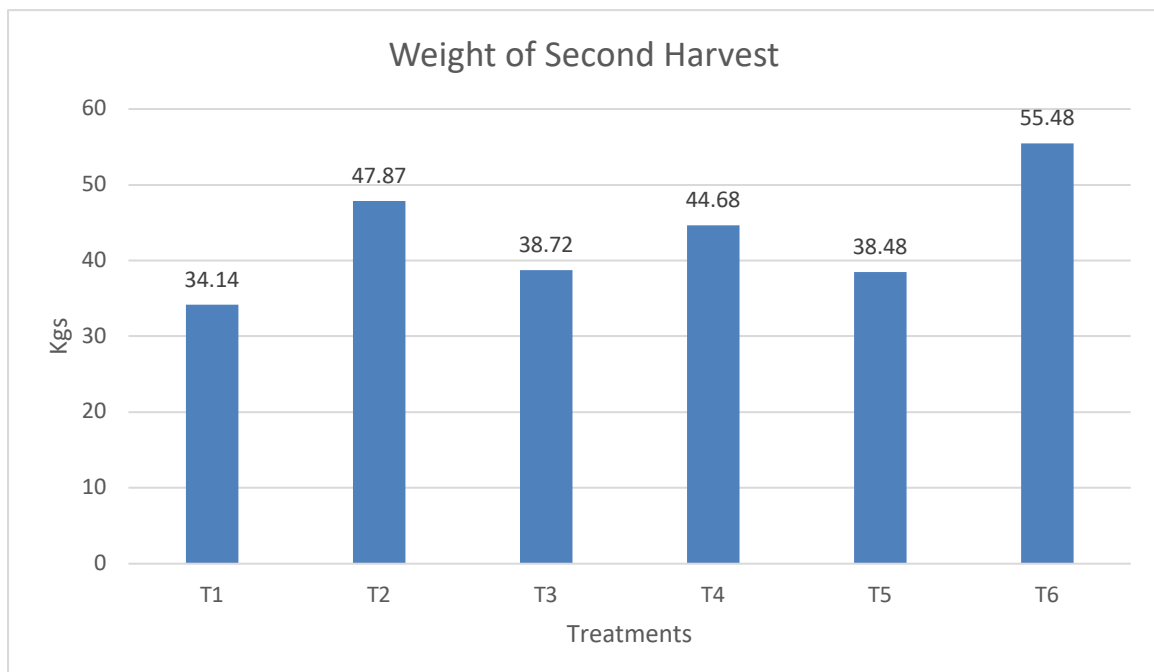
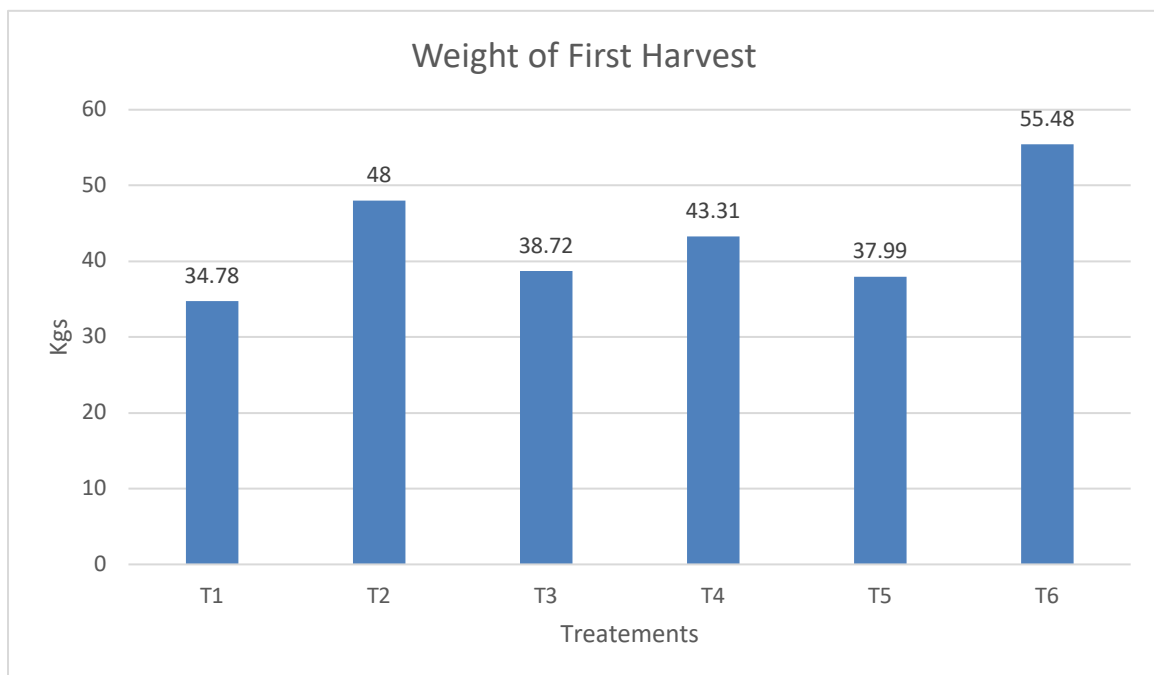
The highest number of bunches was 12 recorded from the palm where Hyfer Urea Max was added to the inorganic fertilizer(T6 and T4), however, comparison of bunches mean showed no significant difference in the number of bunches counted per tree.

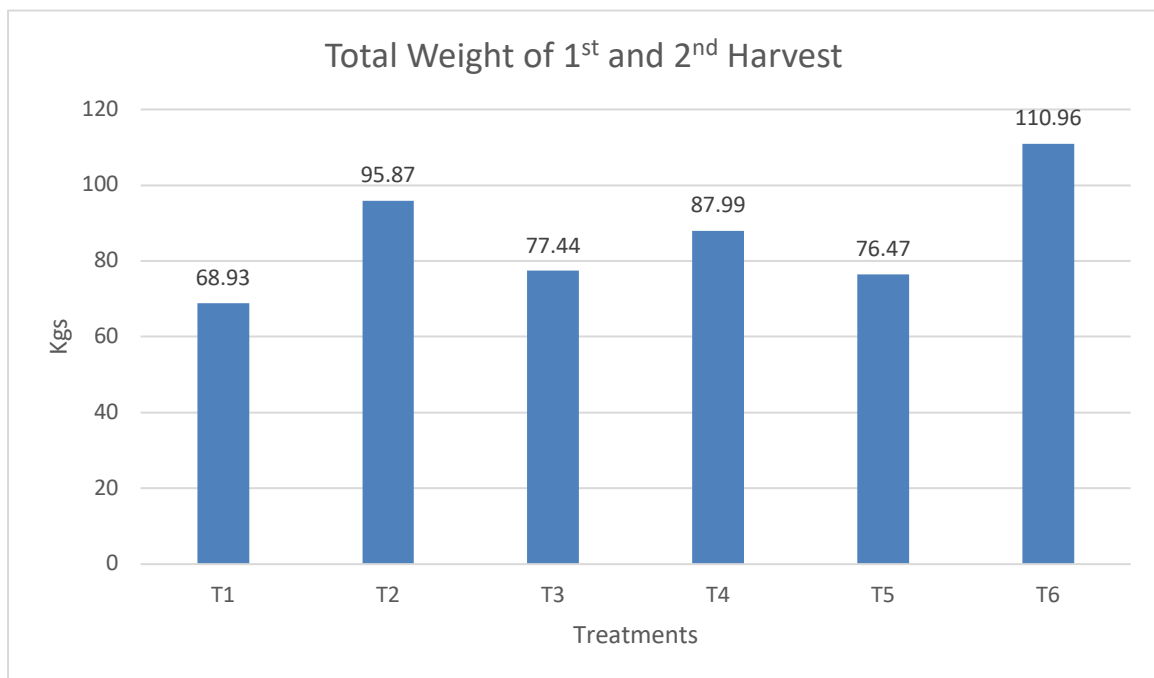


Average weight of Bunch/Tree(kgs)

Statistical analysis on the total weight in kilos of the two harvests showed that the addition of Hyfer Urea Max Fertilizer in the full dose of inorganic fertilizer(T6) revealed a significant difference of 15.09 kilograms against taken from palms fertilized with inorganic fertilizer(T2) alone. The former registered an average weight of 110.96 kilograms and the latter treatment recorded an average bunch weight of 95.87 kilograms per tree.

The application of 250 grams per tree of Hyfer Urea Max Fertilizer produced 76.47 kilograms of fruit, significantly better by 7.54 kilograms over unfertilized oil palm.

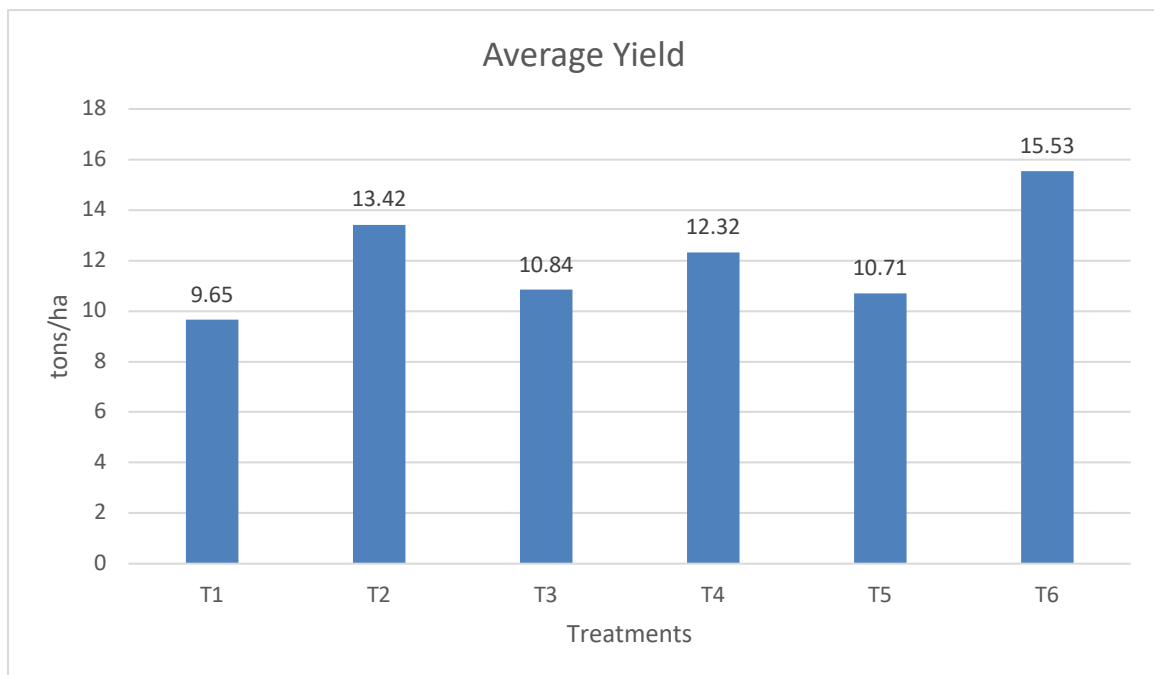




Average Yield(Tons/ha)

The application of 250 grams per oil palm tree in addition to 108-74-309 kilograms per hectare of NPK(T6) exhibited an average yield of 15.53 tons per hectare remarkably better by 2.11 tons against those fertilized with 108-74-309 kilograms per hectare of NPK(T2) alone. T2 Trees obtained a harvest of 13.42 tons per hectare.

Oil palm trees treated with 250 grams Hyfer Urea Max Fertilizer(T5) per tree registered an average yield of 10.71 tons per hectare, significantly higher by 1.06 tons over untreated(T1) oil palm trees.



Conclusion and Recommendation

Hyfer Urea Max Fertilizer brought a significant influence on the yield components of oil palm trees. The addition of the same to inorganic fertilization significantly increased the yield by 2.11 tons over those treated of inorganic fertilizer alone, and 5.88 tons against unfertilized oil palm trees. The addition of Hyfer Urea Max Fertilizer alone revealed significant increase in yield by 37.9% over the unfertilized trees.

Based on the result of the study, the use of Hyfer Urea Max Fertilizer as a source of fertilizer N is recommended for oil palm production.

Appendices

Appendix Table 1. Analysis of variance on Number of Bunch/Tree

Sources of variance	Degrees of freedom	Sums of squares	Means squares	F Value	Pr > F
Rep	5	4.0000	0.8000	3.16	0.0241
Trt	5	3.6667	0.7333	2.89	0.0339
Error	25	6.3333	0.2533		
Total	35	14.0000			

CV= 3.50%

Appendix Table 2. Analysis of variance on Weight of First Harvest

Sources of variance	Degrees of freedom	Sums of squares	Means squares	F Value	Pr > F
Rep	5	49.9291	9.9858	1.93	0.1245
Trt	5	1751.3047	350.2609	67.79	0.0000
Error	25	129.1735	5.1669		
Total	35	1930.4073			

CV= 4.90%

Appendix Table 3. Analysis of variance on Weight of Second Harvest

Sources of variance	Degrees of freedom	Sums of squares	Means squares	F Value	Pr > F
Rep	5	35.5191	7.1038	1.12	0.3770
Trt	5	1794.6739	358.9348	56.41	0.0000
Error	25	159.0691	6.3628		
Total	35	1989.2622			

CV= 4.70%

Appendix Table 4. Analysis of variance on Total Weight of 1st and 2nd Harvest

Sources of variance	Degrees of freedom	Sums of squares	Means squares	F Value	Pr > F
Rep	5	122.3371	24.4674	1.39	0.2619
Trt	5	7078.1272	1415.6254	80.42	0.0000
Error	25	440.0753	17.6030		
Total	35	7640.5396			

CV= 4.90%

Appendix Table 5. Analysis of variance on Average Yield

Sources of variance	Degrees of freedom	Sums of squares	Means squares	F Value	Pr > F
Rep	5	2.3984	0.4797	1.39	0.2617
Trt	5	138.7318	27.7464	80.42	0.0000
Error	25	8.6254	0.3450		
Total	35	149.7556			

CV= 4.90%