EFFICACY EVALUATION OF HYFER PLUS (GREEN) AS FOLIAR FERTILIZER FOR LETTUCE

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ABSTRACT

A field trial designed to assess the efficacy of Hyfer Plus (HP) green foliar fertilizer for lettuce was conducted at the Univeristy of the Philippines, Central Experiment Station (UPLB-CES) during the wet season (October – December) of 2010. Hyfer plus was found to be effective in promoting the yield of lettuce. Application of fertilizer whether Recommended Rate of Inorganic Fertilizer (RRIF) or Recommended Rate of Hyfer Plus (RRHP) alone or as a supplement to RRIF fertilization will significantly increase the number of leaves per plant , leaf width, height of plants, weight of plants and yield over the control . Irrespective of fertilizer used there was a consistent increased in yield as the level of nutrient is increased relative to the control. This results require further validation during dry season cropping period.

INTRODUCTION

Hyper Plus green is registered at Fertilizer and Pesticide Authority (FPA) as an effective foliar fertilizer for rice. Results of field trials in lowland rice showed improved effects on yield. Hyfer Plus represents a breakthrough for higher and profitable yields. Some of the benefits claimed to be derived from Hyfer Plus are as follows: a) it enhances vigorous growth and development for having a unique blend of essential macro and micro nutrients b) quality sticker that minimized washed off in case of heavy rains and c)

improves pollination and fruit set, d) lower incidence of flower and fruit drop, e) hasten maturity and development and f) reduced the undesirable effects of bad weather.

Driven by generally favorable market acceptance and preference when tried in other crops by end-users, the manufacturer, Multi Lines Inc. (MLI) decided to expand its label to include registration in lettuce. However, all these claims must be validated by conducting field trials at different locations and cropping seasons.

OBJECTIVES

1. To evaluate the effectiveness of Hyfer Plus Fertilizer (Green) on lettuce
2. To generate field data needed by the Fertilizer nd Pesticide Authority for label expansion purposes.

III. MATERIALS AND METHODS

1. Product Description

HYFER PLUS fertilizer contains the following ingredients of the major and minor elements for the standard product that Multi Lines Inc. (MLI) market locally.

Nitrogen (N)	- 22 %
Phosphorous (P2O5)	- 11 %
Potassium as (K_20)	- 9 %

It is a unique blend of properly balanced macro and micro nutrients, humic acid, vitamins, hormones and sticker. It also contains traced amounts of boron, copper, calcium, iron, manganese, molybdenum, sodium, sulfur and zinc,

It is compatible with most agricultural insecticides and fungicides.

2. Experimental Requirement

   - Site: Central Experiment Station, University of the Philippines at Los Baños, Laguna.
   - Soil Analysis: Before Experiment
   - Crop: Lettuce
   - Variety: Grand Rapids
   - Treatments: Six (6)
   - Replications: Three (3)
   - Design: RCBD

3. Treatments as prescribed by FPA (Fertilizer and Pesticide Authority, Regulatory Division).

   T1 – Control

   T2 – Recommended Rate of Conventional Fertilizer based on soil Analysis.

   T3 – ½ Recommended Rate of Conventional Fertilizer.

   T4 - Recommended Rate of Hyfer Plus Foliar green Fertilizer

   T5 – ½ Recommended Rate of CF + Full Recommended Rate of Hyfer Plus foliar fertilizer

   T6 - Full Recommended Rate of CF + Full Recommended Rate of Hyfer Plus foliar fertilizer

4. Fertilizer Application

A. Hyfer Plus (Green) foliar fertilizer application

Hyfer Plus foliar was sprayed on the leaves at the rate of 1 L/ha at 5, 10 and 15 DAT.

B. Inorganic fertilizer

Treatment 2 – Basal applications of 60.6 g of 46-0-0 , 50 g of 16-20-0, and 25 g of 0-0-60 were applied. Another 85 g of 46-00 was side- dressed at 10 DAT.

Treatment 3 – Basal applications of 30.3 g of 46-0-0, 25 g of 16-20-0 and 12.5 g of 0-0-60, were applied. Another 42.5 g of 46-00 was side dressed at 10 DAT.

Treatment 4 – Hyfer Plus green foliar fertilizer alone at the rate of 1L/ha was sprayed on the leaves until the spray started to drip at 5,10, and 15 DAT.

Treatment 5 – Basal applications of 30.3 g of 46-0-0, 25 g of 16-20-0 and 12.5 g of 0-0-60, were applied. Another 42.5 g of 46-00 was side dressed at 10 DAT. Hyfer Plus green foliar fertilizer was sprayed on the leaves at the rate of 1 L/ha at 5, 10, and 15 DAT.

Treatment 6 - Basal applications of 60.6 g of 46-0-0 , 50 g of 16-20-0, and 25 g of 0-0-60 were applied. Another 85 g of 46-00 was side- dressed at 10 DAT.

Hyfer Plus green foliar fertilizer was sprayed on the leaves at the rate of 1 L/ha at 5, 10, and 15DAT.

5. Raising of Seedlings, Transplanting and Maintenance

Seeds were sown in seed boxes and the seedlings were transplanted three (3) weeks after seeds have germinated. One seedling was transplanted per hill with a distancing of 15 cm between hills and 20 cm between rows. The plant density was 132 plants per plot ($5m^2$) or a total of 396 plants per treatment.

6. Cultural Requirement

Standard cultural requirements for lettuce production were followed. Furthermore, extreme weather conditions which may influence the performance of the field trials were recorded to help in explaining the final results.

7. Harvesting and Data gathering

Harvesting of lettuce was done at 26 days after transplanting.

Data gathered at harvest were:

a. Marketable yield – all plants in individual plots were harvested, and weighed .The yields were expressed in tons per hectare.

b. Plant height (cm) – Ten (10) representative plants per plot were taken at random and the height was measured using a ruler starting from the base up to the tip of the longest leaf. The average plant height for each plot was calculated.

c. Number of leaves per plant – Ten (10) representative plants per plot were taken at random and the number of fully expanded leaves per

plant were counted. The data were expressed as average number of leaves per plant.

d. Width of leaf – Ten (10) representative leaves per plot were measured and expressed as average width of leaf per plant.

IV. RESULTS AND DISCUSSION

The results of the trial are shown graphically in Figures 1 to 5 and summarized in Table 1.

The different treatments influenced significantly the plant height, number and width of leaves, weight of plant and yield of lettuce at harvest. The recommended rate of Hyfer Plus (green) foliar fertilizer increased significantly the number of leaves but the increment was higher with the conventional fertilizer (Figure 1). As reflected in the summary table (Table 1), all treatments increased all parameters significantly over the control. The performance of Hyfer Plus (green) in combination with ½ recommended rate of conventional fertilizer was significantly better than the performance of either Hyfer Plus alone or ½ recommended rate of conventional fertilizer, indicating a positive interaction between Hyfer Plus and ½ recommended rate of conventional fertilizer.

A much better positive interaction was noted between Hyfer Plus alone and recommended rate of conventional fertilizer. However, for economic reasons, it would be better to recommend to the farmers a combination of the recommended rate of Hyfer Plus (green) with ½ the recommended rate of conventional fertilizer. This approach will definitely result in much higher cost savings.

V. SUMMARY AND CONCLUSION

The data for the efficacy trial showed that the new product, HYFER PLUS Green foliar fertilizer was effective in increasing significantly the average number of leaves , height, leaf width and yield of lettuce over the control.

Hence, the new product, Hyfer Plus Green foliar fertilizer may qualify for provisional registration by the Fertilizer and Pesticide Authority (FPA) as long as it is applied together with conventional fertilizer at ½ recommended rate.

VI. RECOMMENDATION

On the basis of the results obtained from the efficacy testing on lettuce, provisional Fertilizer and Pesticide Authority registration is recommended for HYFER PLUS (green) foliar fertilizer.

For purposes of full registration, there is a need to conduct another field trial during the dry season period.

Table 1. Summary data (means) on growth and yield parameters of lettuce plant as affected by Hyfer Plus (green) 22-11-9.

Treatment	Description	No. of Leaves	Height (cm)	Leaf width (cm)	Weight of ten (10) plants (g)	Yield (t/ha)
1	Control	5.00[d]	8.03e	3.83[e]	150.90[e]	3.5[e]
2	RRCF	8.00[b]	14.67[c]	6.83[c]	371.33[c]	8.2[c]
3	½ RRCF	6.67[c]	10.77[d]	5.90[d]	340.50[d]	6.8[d]
4	RR Hyfer plus (green)	6.33[c]	11.13[d]	5.83[d]	344.40[d]	7.0[d]
5	½ RRCF + RR Hyfer Plus (green)	8.33[b]	17.03[b]	7.73[b]	441.87[b]	11.3[b]
6	RRCF + RR Hyfer Plus (green)	9.67[a]	20.00[a]	8.57[a]	551.83[a]	12.1[a]

Treatment means followed by the same superscript letter are not significantly different at 5% level

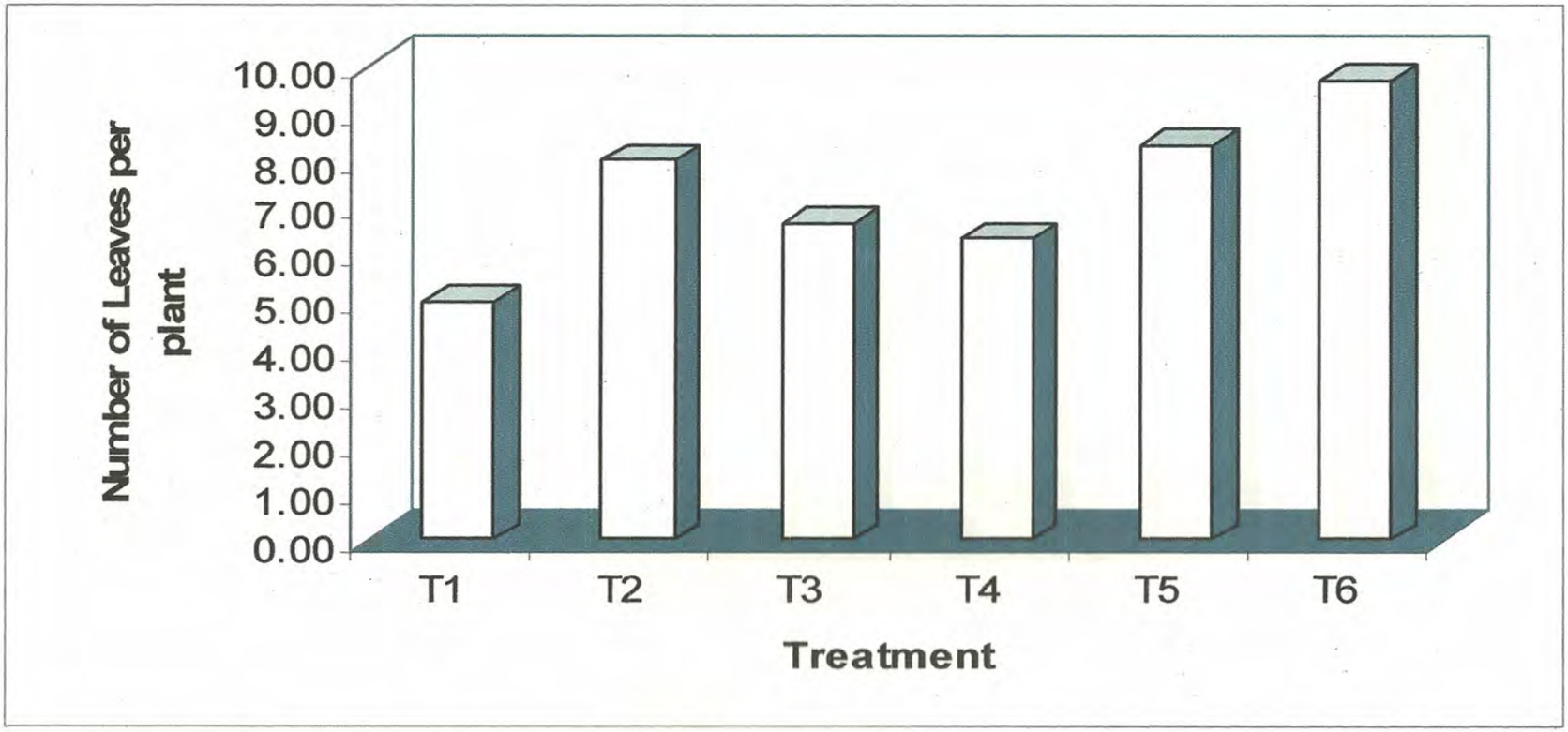

Figure 1. Number of leaves per plant as affected by different treatments. (Legend: T1 –Control; T2 – Recommended Rate of Conventional Fertilizer; T3 – ½ Recommended Rate of Conventional Fertilizer ; T4 - Recommended Rate of Hyfer Plus (green) ; T5 – ½ recommended Rate of Conventional Fertilizer + Full Recommended Rate of Hyfer Plus Green; T6 - Full Recommended Rate of Conventional Fertilizer + Full Recommended Rate of Hyfer Plus).

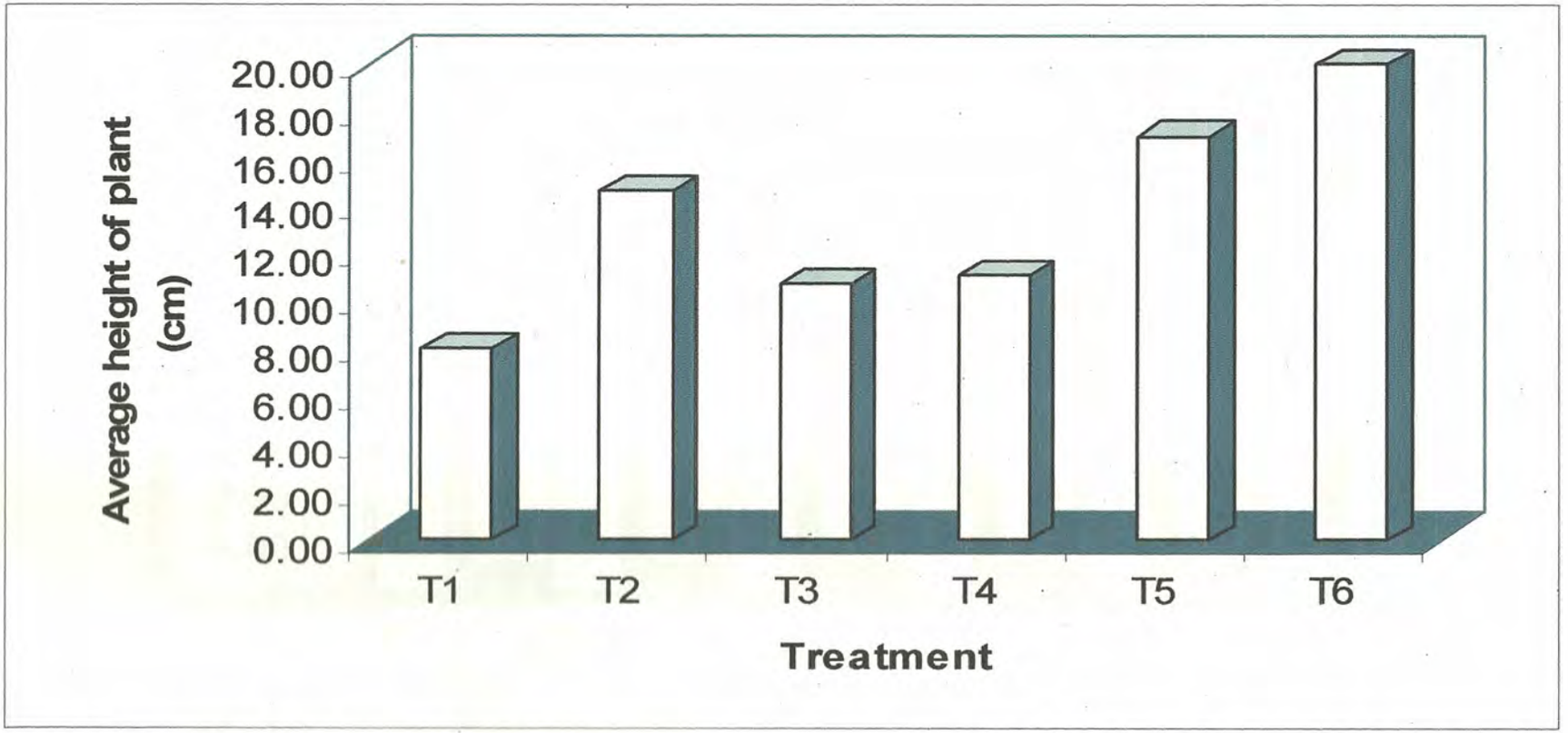

Figure 2. Average height of plant as affected by different treatments. (Legend: T1 –Control; T2 – Recommended Rate of Conventional Fertilizer; T3 – ½ Recommended Rate of Conventional Fertilizer ; T4 - Recommended Rate of Hyfer Plus (green) ; T5 – ½ recommended Rate of Conventional Fertilizer + Full Recommended Rate of Hyfer Plus Green; T6 - Full Recommended Rate of Conventional Fertilizer + Full Recommended Rate of Hyfer Plus).

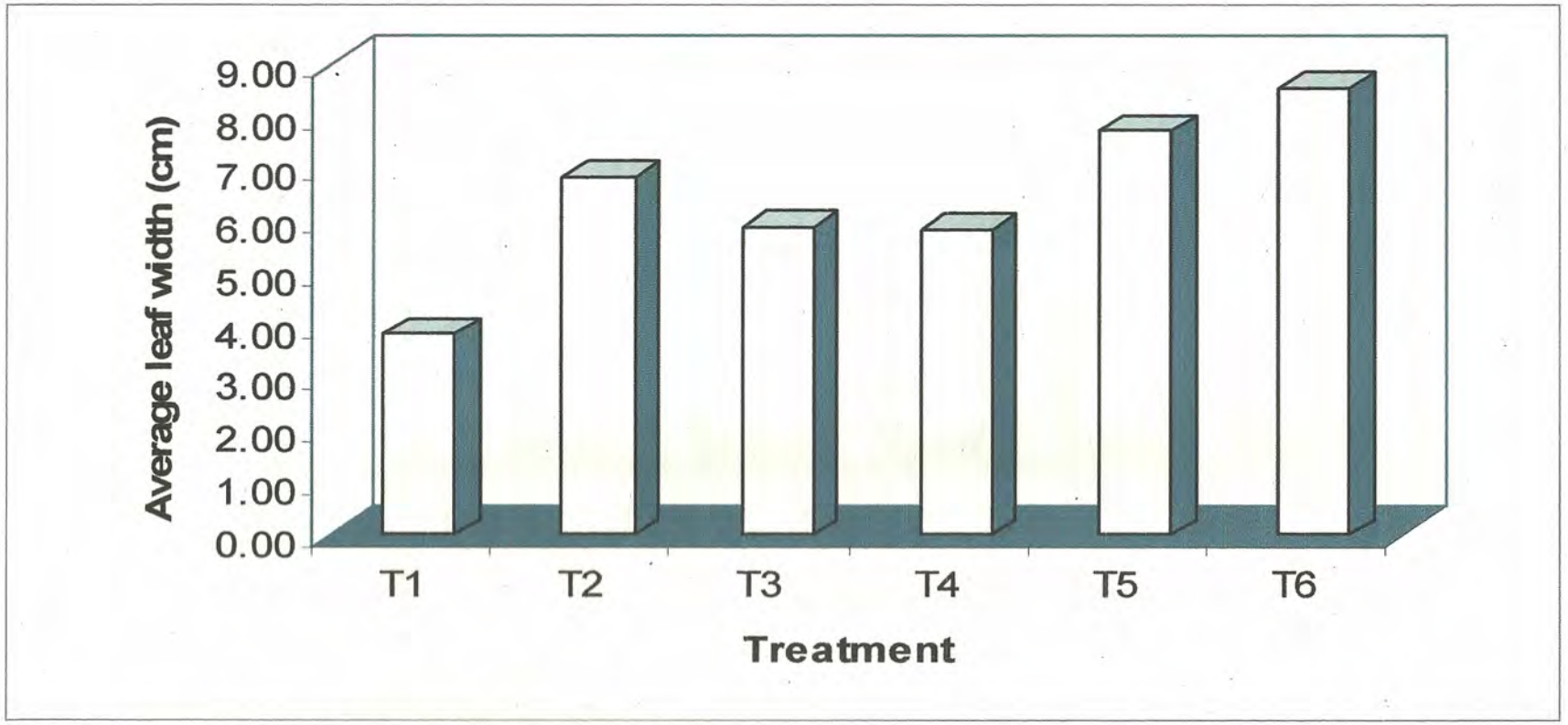

Figure 3. Average leaf width per plant as affected by different treatments. (Legend: T1 –Control; T2 – Recommended Rate of Conventional Fertilizer; T3 – ½ Recommended Rate of Conventional Fertilizer ; T4 - Recommended Rate of Hyfer Plus (green) ; T5 – ½ recommended Rate of Conventional Fertilizer + Full Recommended Rate of Hyfer Plus Green; T6 - Full Recommended Rate of Conventional Fertilizer + Full Recommended Rate of Hyfer Plus).

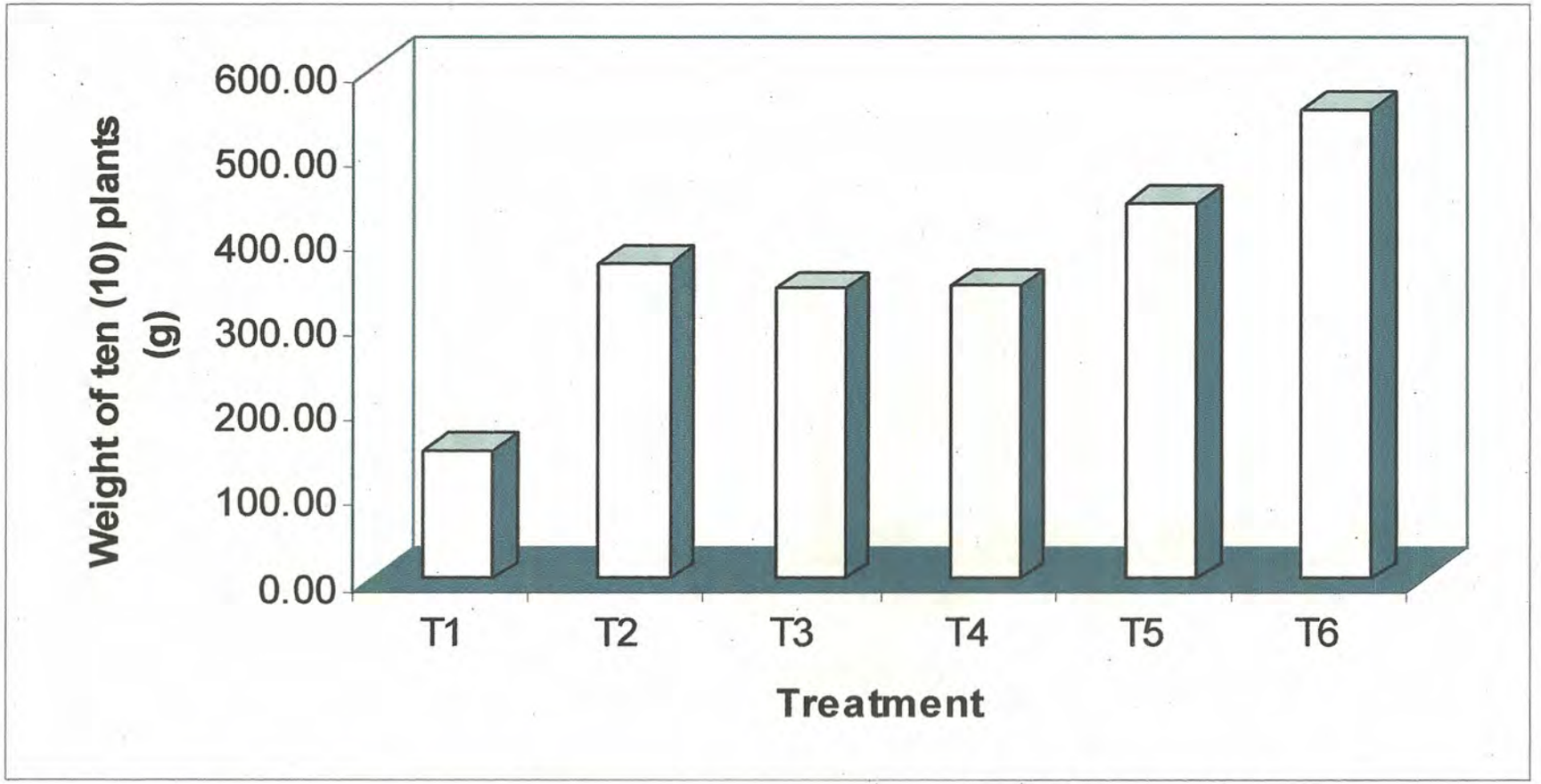

Figure 4. Weight of ten (10) plant as affected by different treatments. (Legend: T1 –Control; T2 – Recommended Rate of Conventional Fertilizer; T3 – ½ Recommended Rate of Conventional Fertilizer ; T4 - Recommended Rate of Hyfer Plus (green) ; T5 – ½ recommended Rate of Conventional Fertilizer + Full Recommended Rate of Hyfer Plus Green; T6 - Full Recommended Rate of Conventional Fertilizer + Full Recommended Rate of Hyfer Plus).

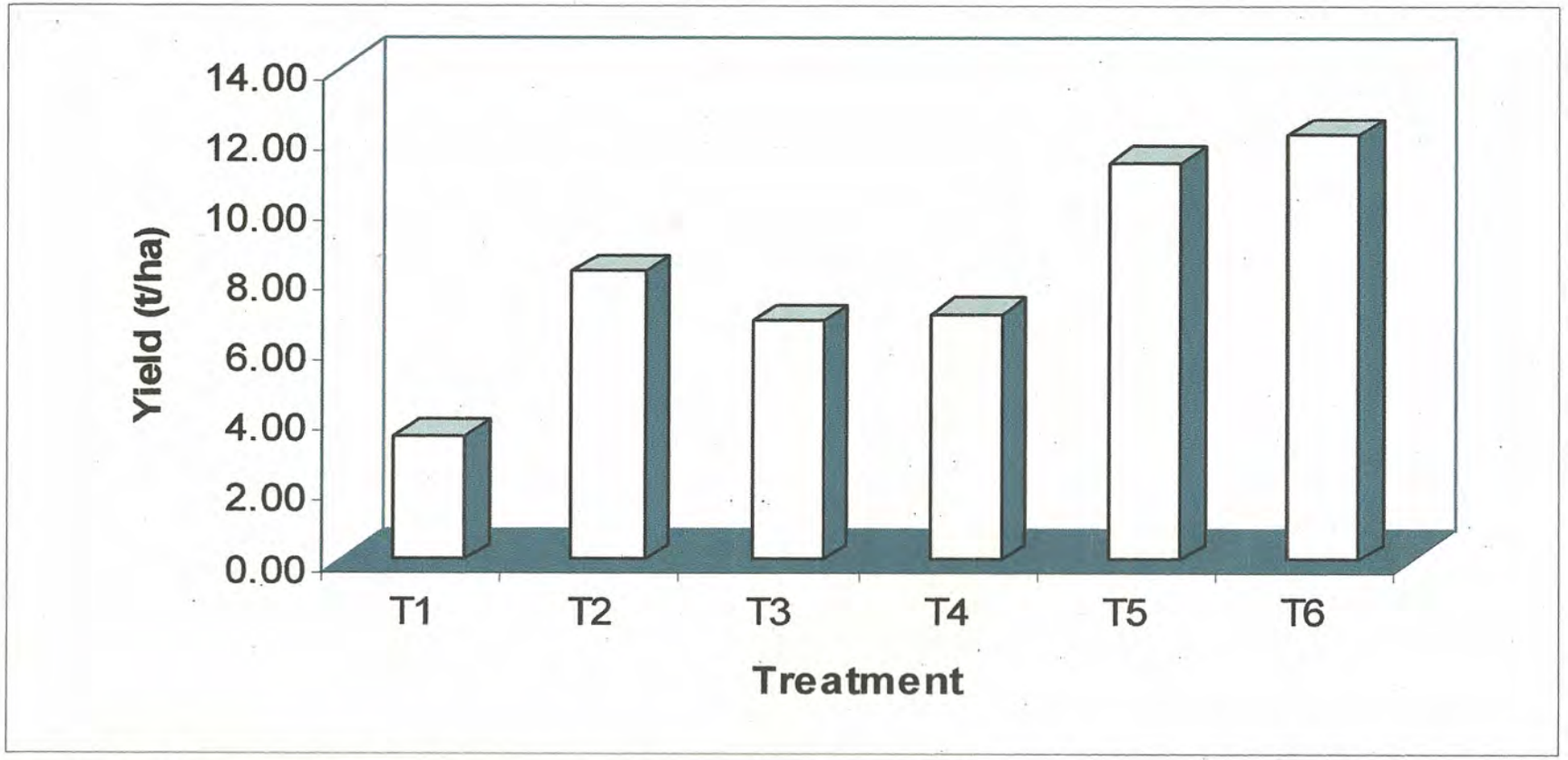

Figure 5 . Yield (t/ha) as affected by different treatments. (Legend: T1 –Control; T2 – Recommended Rate of Conventional Fertilizer; T3 – ½ Recommended Rate of Conventional Fertilizer ; T4 - Recommended Rate of Hyfer Plus (green) ; T5 – ½ recommended Rate of Conventional Fertilizer + Full Recommended Rate of Hyfer Plus Green; T6 - Full Recommended Rate of Conventional Fertilizer + Full Recommended Rate of Hyfer Plus).