Effect of Organic Manure and Inorganic Fertilizer on Yield and Yield Components of DU 16 Rice Variety

By

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1. Introduction

- Muse district is located in the border area of Myanmar and China.
- Practicing mechanized farming due to labour shortage and readily available farm machines from China- use of farm animals (cows and buffaloes) for farm operating process getting low
- Excessive and over use of inorganic fertilizer is practicing to maintain crops' yield stability- soil degradation, pest infestation and unsafety crop production is resulted.

2. Problem Statement

- Using high dosage of registered inorganic fertilizer
- Adopting fertilizer application practice of Chinese farmers from border area
- Receive inputs in kind from contract farming system
- Reduce the use of organic manure

- Extending knowledge- Growing crops using registered fertilizer- recommended rate of fertilizer- combination of organic and inorganic fertilizer- is the solution to increase crop productivity and soil sustainability.

3. Research objectives

- To compare the yield and yield components of DU 16 rice variety in response to different fertilizer management practices
- To compare the cost of production in relation to different fertilizer treatments
- To extend the knowledge of farmers for application of registered and recommended fertilizer application practice towards the adoption of GAP for their crop productivity and quality.

4. Materials and methods

4.1 Description of the experiment

Tested Crop Year	2018-2019, Monsoon Season
Tested location	Hosai IHTDV, Nankham Township, Muse District
Contact Farmer	U Soe Myint
Field Incharge	District LUD Team , Muse District
Experimental Design	RCB (4 Treatments x 3 Replications)
Plot size	440 m^2
Sub plot size	25 m^2
Spacing	20 cm x 15 cm
Variety	DU 16
Treatments	T1- (OM 0.5 tons+ Urea 70 kg+ Compound (15:15:15) 50 kg + Potash 20 kg)/ acre
	T2- OM 2 tons/acre
	T3- (Urea 160 kg+ Compound (15:15:15) 50 Kg+ T super 100 kg)/acre
	T4- Without fertilizer (Control)

4. Materials and methods

4.2 Layout RCB Design and making double band for experimental plot

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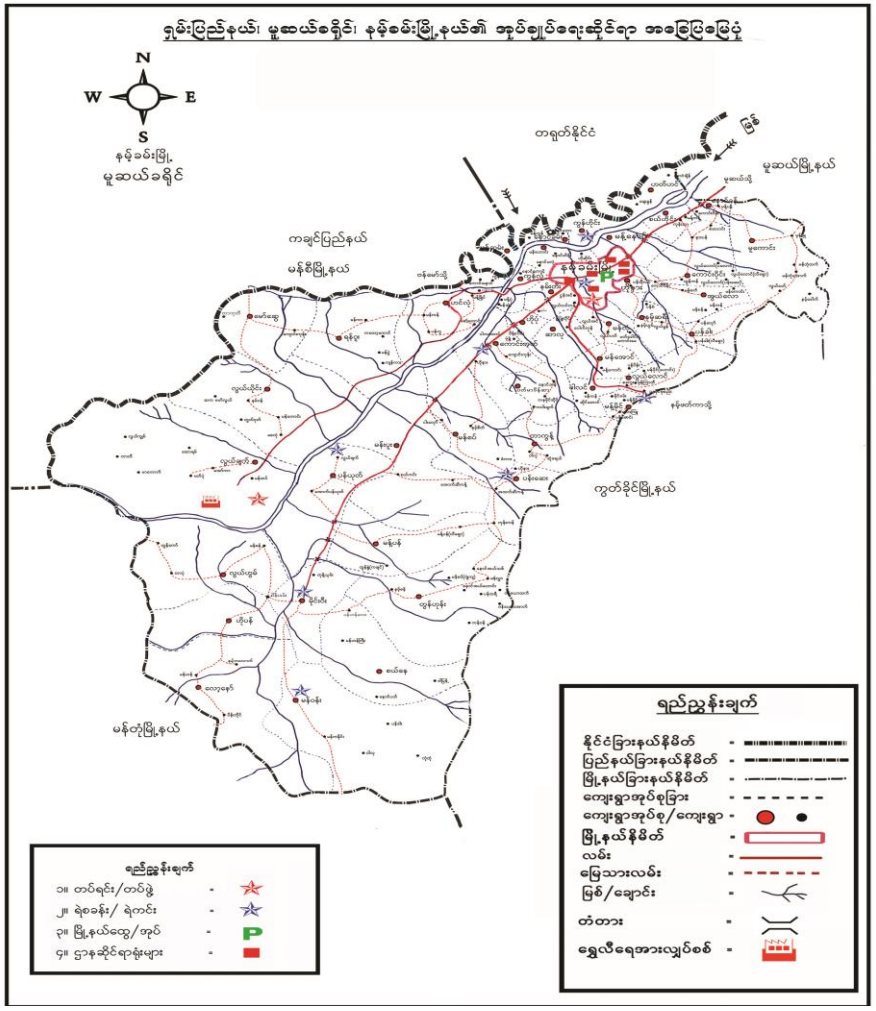
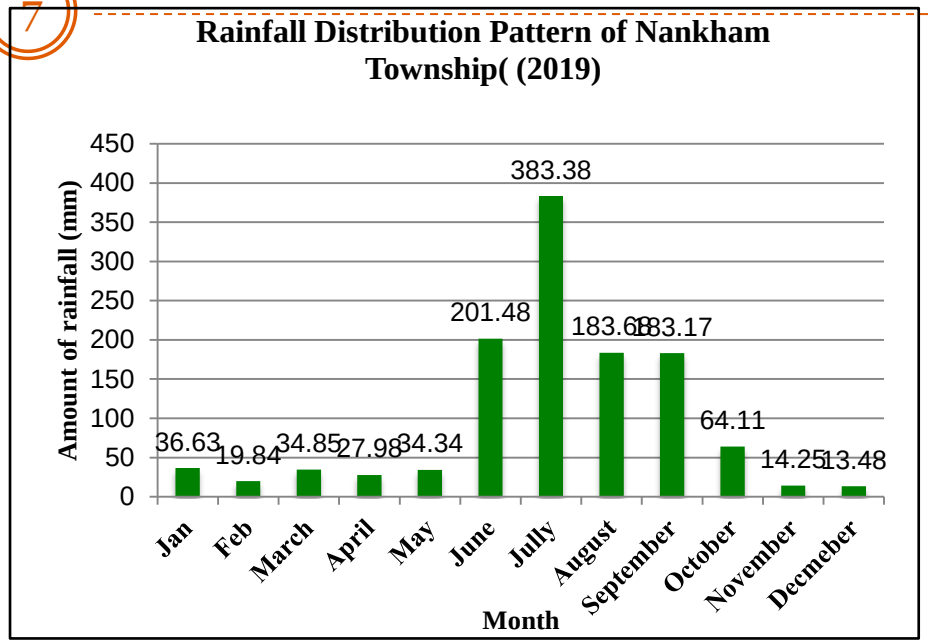
No	Research Objectives	Materials and Methods
1	Comparing different fertilizer management practices	Experimental Plot (RCB Design) Test Statistics- Statistix 9, Descriptive

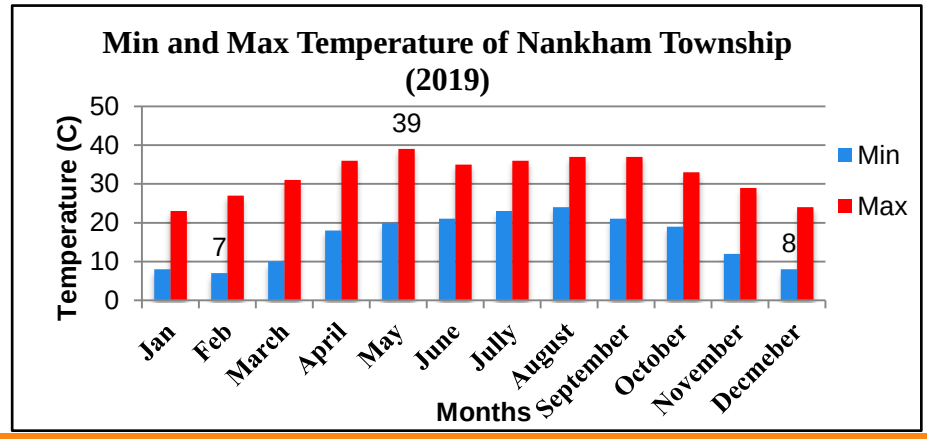
Rep 1	1 B	2 A	3 D	4 C
Rep 2	1 D	2 C	3 A	4 B
Rep 3	1 C	2 B	3 A	4 D

5. Results and Discussions

5.1 Geographic and climatic condition of Nankham Township

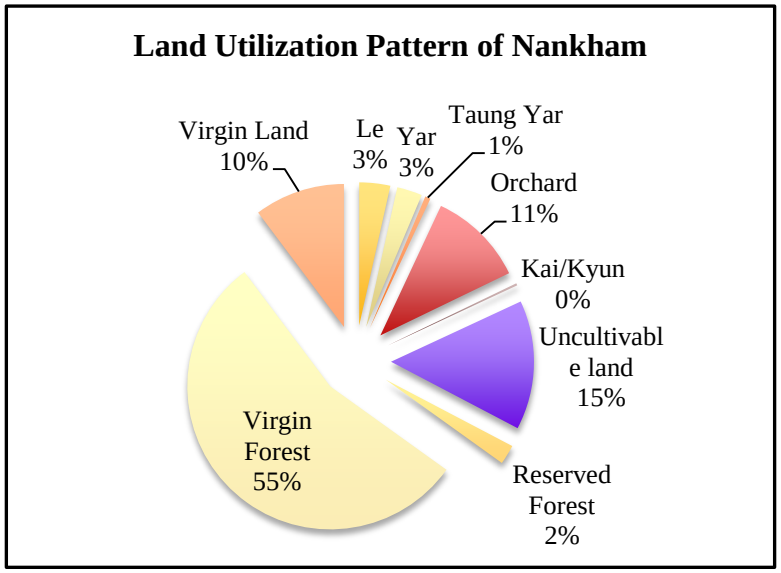


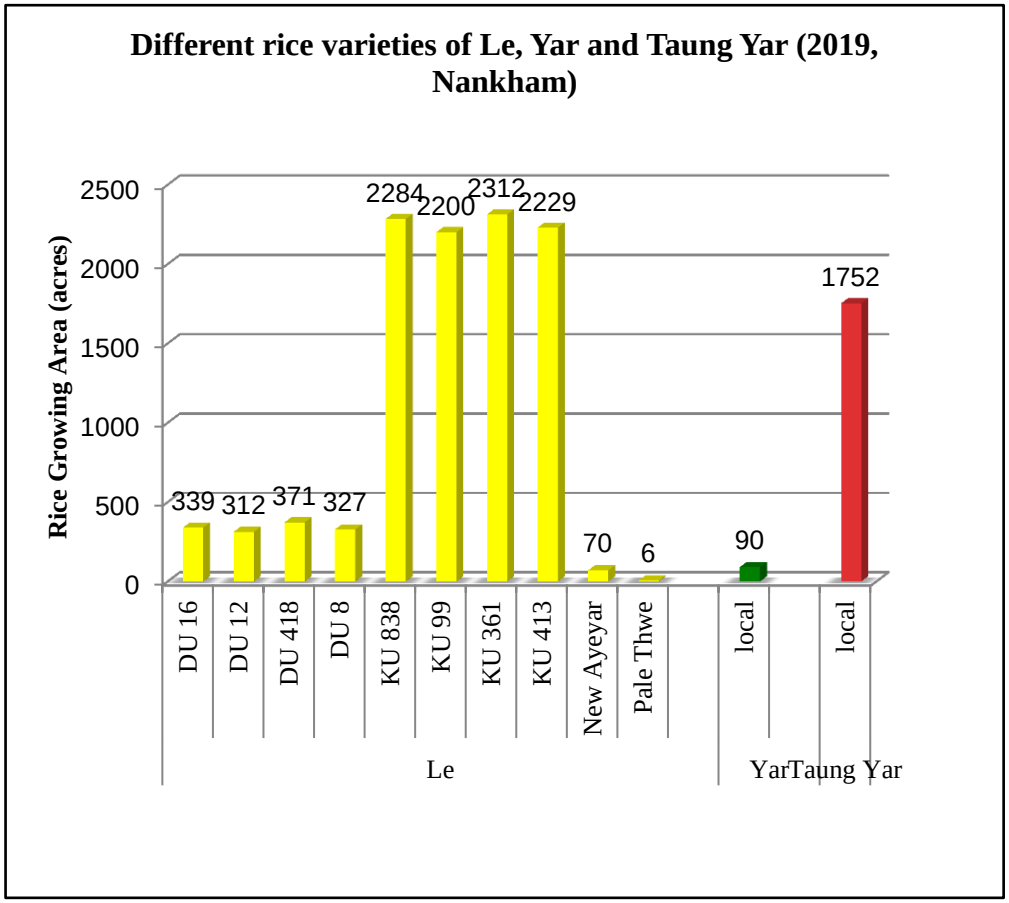




5. Results and Discussions

5.2 Land Utilization Pattern and Varieties of Rice grown in Nankham





5. Results and Discussions

5.3 Analytical results of soil sample before the experiment

Analytical Results of Soil Sample Before the Experiment								
Soil Sample plot	pH Soil:Water 1:2.5	EC	Organic Carbon (%)	Humus (%)	Total N (%)	Exchangeable Cations	Available Nutrients	
						K^+	K_2O (mg/100g)	P (ppm)
U Soe Myint	6.12	0.27	1.91	3.30	0.25	0.281	13.2	47.4
	Slightly acid	low	low		Medium		Medium	Medium

Recommended Rate of Fertilizer for Rice (pH=5.5-6)According to Soil Sample Analysis Interpretation Result				
Target Yield Bsk/ac	Soil test Value	Urea kg/ac	T-Super kg/ac	Potash kg/ac
100 (bsk/acre)	Low	107.2	30.9	95.3
	Medium	95.4	24.8	47.3
	High	59.9	12.6	14.7
	Uptake	100.2	33.1	118.1

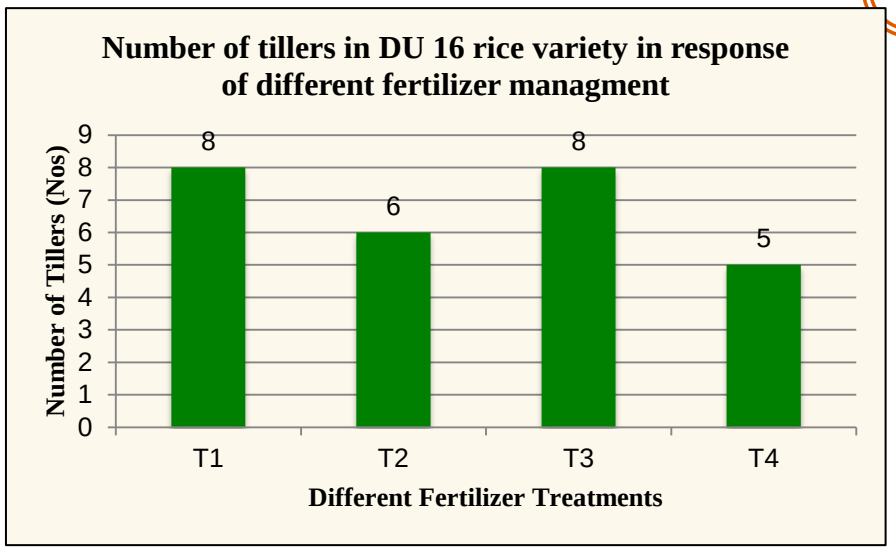
5. Results and Discussions

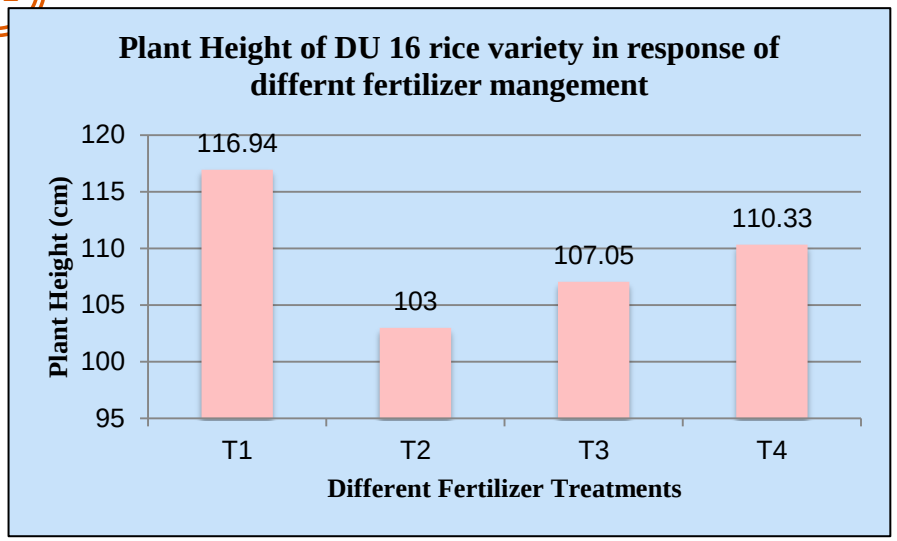
5.4 Collected Data

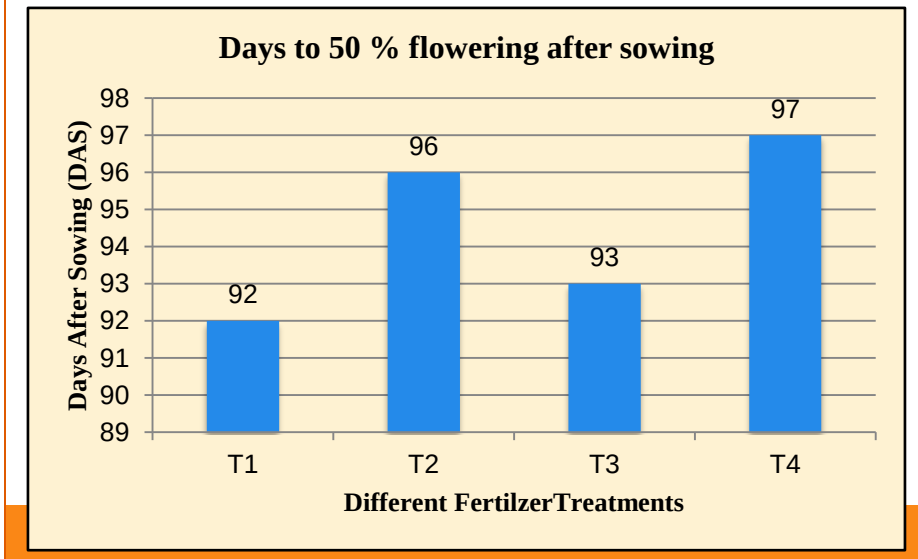
- Crop growth and development character (Number of tillers, plant height, 50 % flowering, Days to harvesting)
- Yield Components – (Number of panicles per $m^{2,}$ Number of grains per panicle, Number of filled grains, 1000- grain weight)
- Yield of sample plot

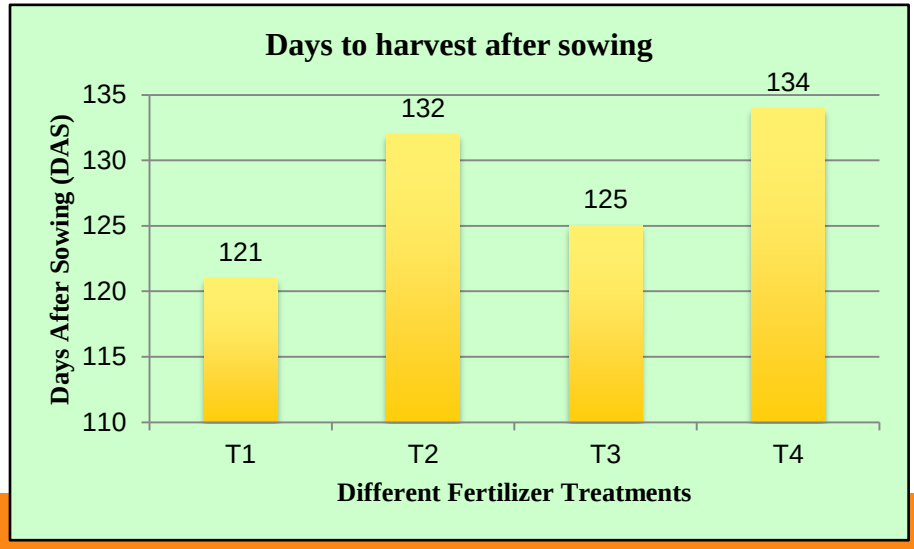
5. Results and Discussions

5.5 Comparison of crop growth and development characters of DU 16 rice variety in response of different fertilizer management practices



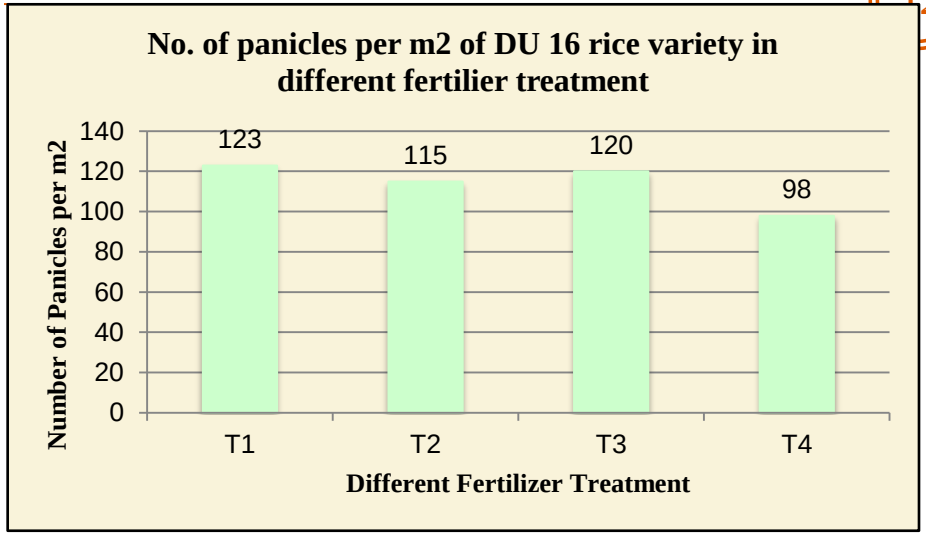


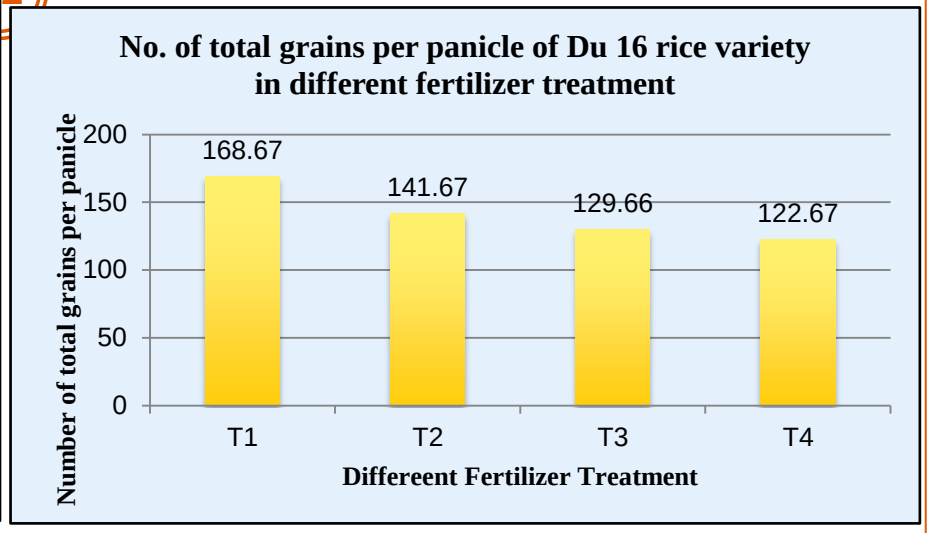


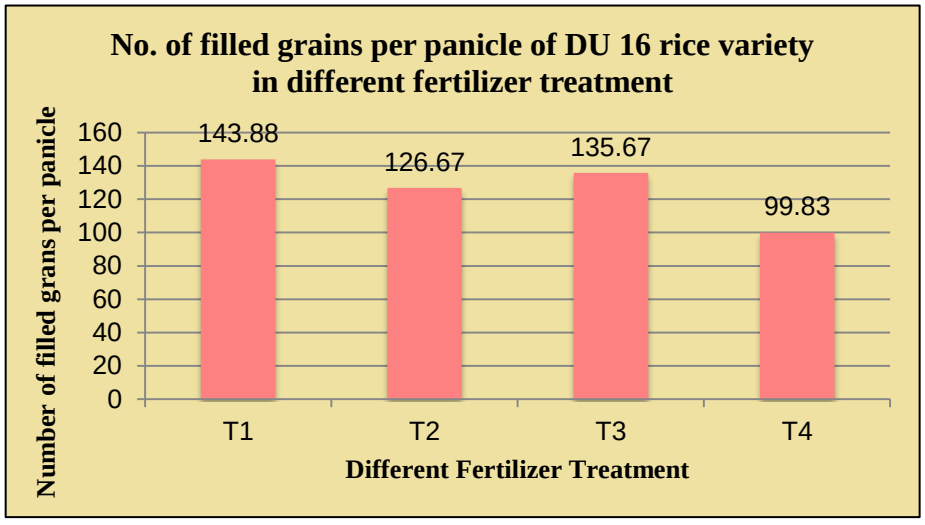


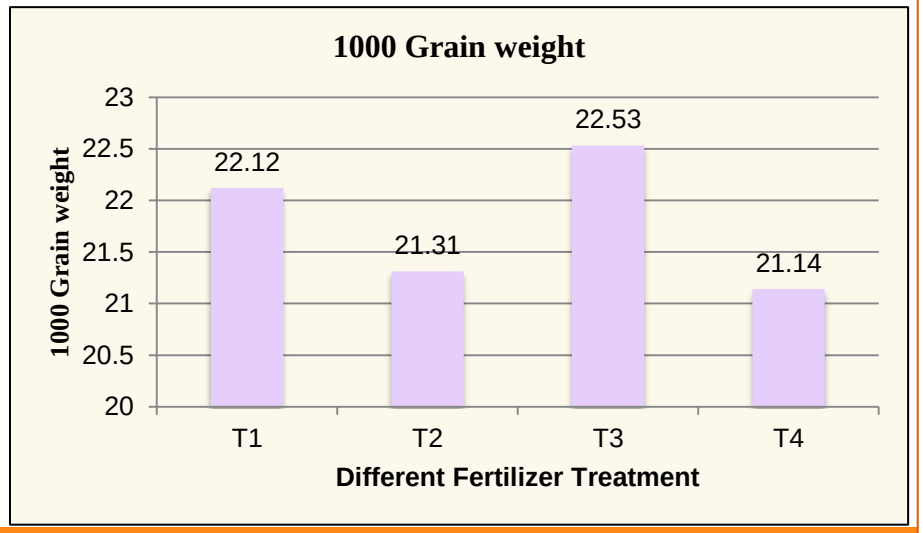
5. Results and Discussions

5.6 Comparison of yield components of DU 16 rice variety in response of different fertilizer management practices



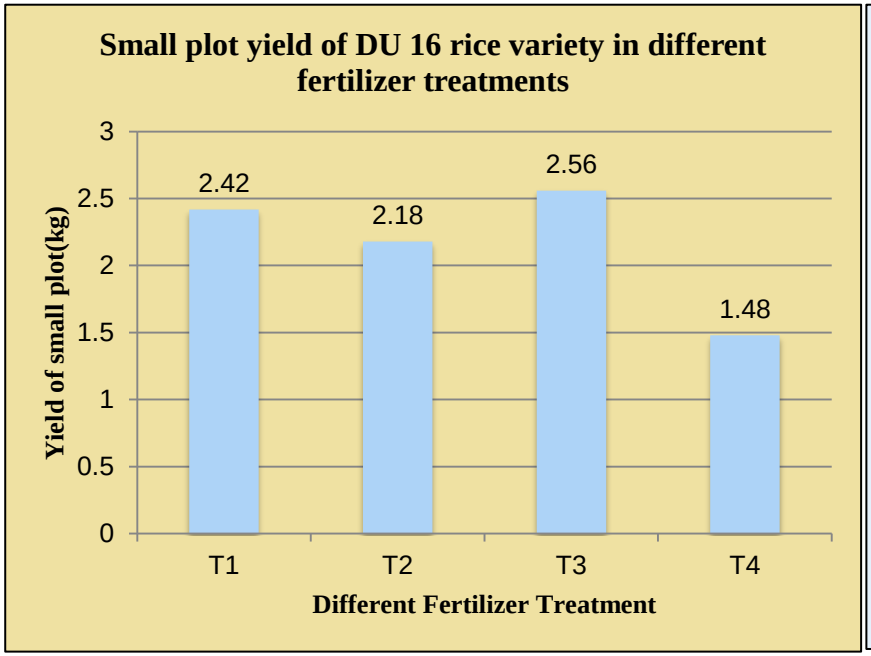


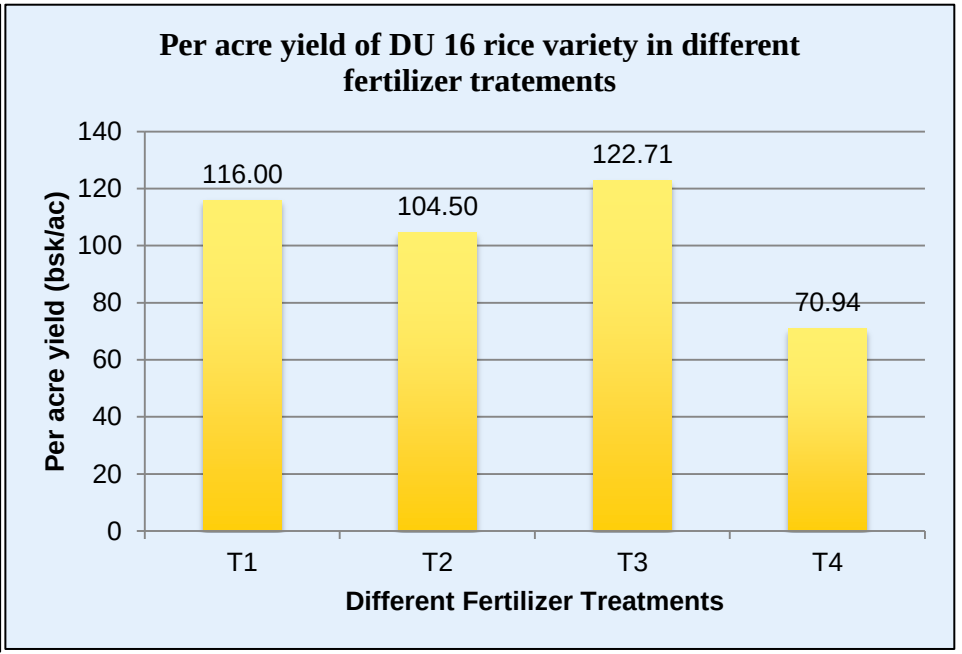




5. Results and Discussions

5.7 Comparison of yield components of DU 16 rice variety in response of different fertilizer management practices





5. Results and Discussions

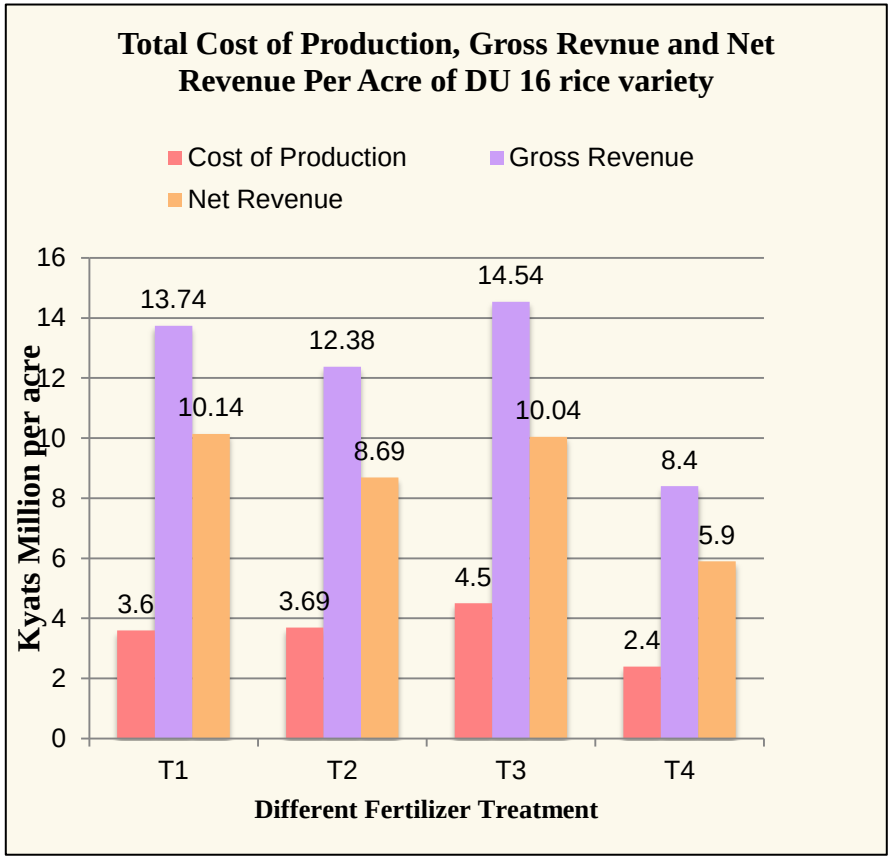
5.8 Yield and yield components as affected by different fertilizer treatments in DU 16 rice variety

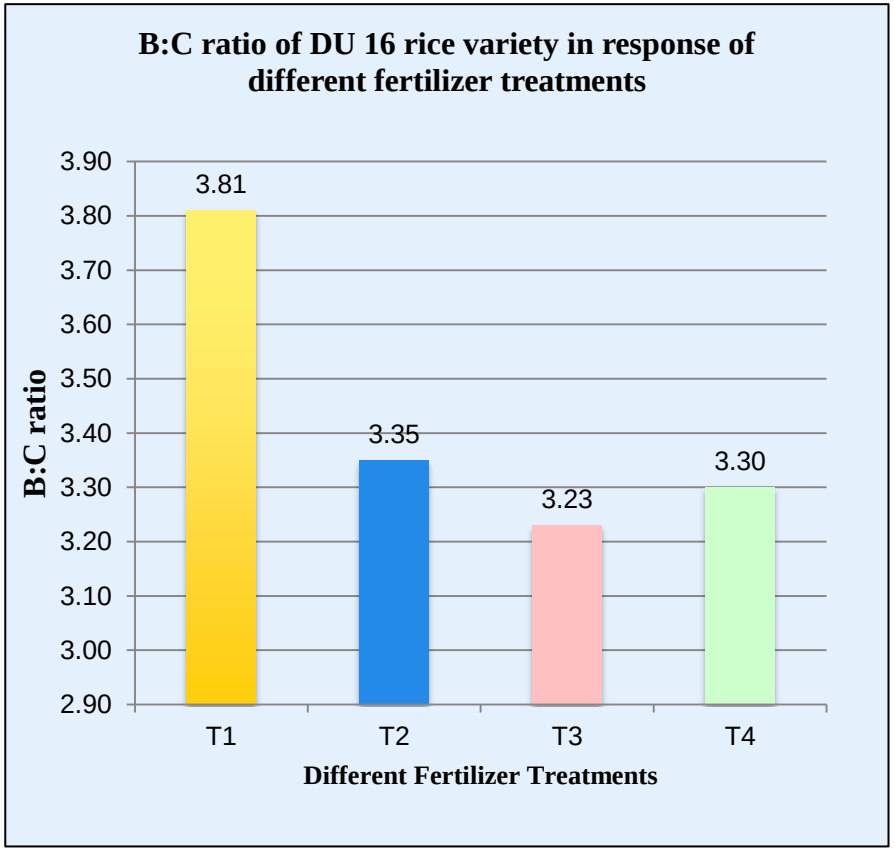
Treatments	Panicles per m ^{2}	1000 grain weight	Filled grain (no)	Small plot yield (kg)
Fertilizer				
T1	122.67a	22.12	141.33a	2.42a
T2	115.12ab	21.31	126.67ab	2.18a
T3	120.22a	22.53	135.67a	2.56a
T4	98.32b	21.14	99.83b	1.48b
LSD $_{0.05}$	18.23	3.03	31.17	0.47
Pr> F	*	ns	*	**
CV %	7.39	6.97	12.91	11.06

Means followed by different letters in the same column are significantly different by LSD test at 5% level.
T1=(OM 0.5 tons+ Urea 70 kg+ Compound (15:15:15) 50 kg + Potash 20 kg)/ acre
T2= OM 2 tons/acre
T3= (Urea 160 kg+ Compound (15:15:15) 50 Kg+ T super 100 kg)/acre
T4= Without fertilizer (Control)

5. Results and Discussions

5.9 Cost and Return Analysis of DU 16 rice variety in response of different fertilizer management





Exchange rate: 1 Yuan= 210 MMK, 1 basket of paddy= 20.9 kg, 2 kyins of paddy= 1 kg of paddy

6. Conclusion and Recommendation

- Number of tillers in T1 and T3 were higher than those in T2 and T4
- Plant height in T1 and T3 were higher than those in T2 and T4
- Early flowering in T1 and late flowering in T2 and T4 were observed
- Statistical analysis of the results revealed that no. of filled grains and no. panicles per m^2 of T1 and T3 are higher than T2 and T4, accordingly, yield of T1, T2 and T3 are significantly higher than T4 at 5 % level of significance.

6. Conclusion and Recommendation

- Compared to T1, T2 and T3, yield of T3 (Farmer Practice) is not much different with T1(Recommended Practice).
- In terms of cost and return analysis, combination of organic and inorganic fertilizer (T1) has the highest B:C ratio.
- Findings of study will extend knowledge of farmers to choose cost effective fertilizer management practice towards soil conservation.
- Findings of the study will also support the fertilizer recommendation of similar areas with same soil and climatic condition

7. Field Activities

7.1 Transplanting, fertilizer application, pesticide application

7. Field Activities

7.2 Field day with farmers

7. Field Activities

7.3 Data collection

References

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THANK YOU