Theme 2
Sustainable soil management for food security and better nutrition

The issue of soil pollution solved using organic farming #03 - Tried out research on *soils for nutrition*

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INTRODUCTION

According to the research The Issue of Soil Pollution Solved Using Organic Farming No.01 and No.02-Tried-out research of Soil Biodiversity, has archived practiced to support SDG2 – Zero hunger provide a more nutritious agri-food system for enhancing human health and wellbeing while protecting the environment.

For this research #03, we focused on a better soil nutrition, which can be transformed to a better agri-food's nutrient. By this method, we used the legumes which can freeze nitrogen gases in the air to the form of which the roots of plants are sucked into the soil, or nitrogen fertilizer fixation process into the soil. After harvest, it's ploughed and buried them for 15-30 days decompose to create the macronutrients and secondary nutrients and organic matter to the soil, and delivered as organic fertilizers to the main crops as rice.

METHODOLOGY

The research of fresh fertilizer from the plowing and buried the leguminous, to create more nutrient to the yield of rice via the soil. We used 6 types of nutrients that rice needed with different qualities on 134 plot sites of rice planting field in Chiang Mai Province, Thailand. We cultivated 3 types of leguminous :Peanut, Soy bean and green bean as the treatment of the experimental research operation in form of the crop rotation plants after harvest the rice and after leguminous harvest, they were plowed and buried to be the fresh fertilizer to improve soil.

The nutrient yield in soil from each plot site is collected after plowing and buried and decomposed for 15-30 days, and after the rice planting to studied the increasing of the nutrient in soil.

RESULTS

The macronutrients (nitrogen, phosphorus and potassium) and the secondary nutrients (calcium, magnesium, sulfur, etc.) and the physical soil tests were carried out before and after the planting of legumes and plowed. The results were analyzed for statistical significance using t-test based on different sample pairs, with the SPSS program. The mean and SD values were taken with tolerance limits of 5%. All data will be evaluated based on 3 levels: None, some and more levels, of the nutrient defined level in soil.

The sample consists of 133 sites of fields (N=133), by randomize selected to plant peanut 48 sites (36.6%), Soy bean 43 sites (32.1%) and green bean 42 sits (31.3%). After the planting of legumes and plowed. the results of the one-way ANOVA: A one-way ANOVA was performed to compare the nutrient defined level in soil of three different conducted studying as follows:

ANOVA						
		Sum of Squares	df	Mean Square	F	Sig.
N_Pretest	Between Groups	0.19	2	0.09	0.38	0.68
	Within Groups	31.63	131	0.24		
N_Posttest	Between Groups	0.65	2	0.33	0.95	0.39
	Within Groups	44.90	131	0.343		
P_Pretest	Between Groups	0.049	2	0.02	0.16	0.85
	Within Groups	20.29	131	0.15		
P_Posttest	Between Groups	0.00	2	0.00	0.01	0.99
	Within Groups	31.08	131	0.24		
K_Pretest	Between Groups	0.03	2	0.02	0.06	0.94
	Within Groups	32.56	131	0.25		
K_Posttest	Between Groups	0.21	2	0.10	0.26	0.77
	Within Groups	52.39	131	0.40		
Ca_Pretest	Between Groups	0.00	2	0.00	0.01	0.99
	Within Groups	33.46	131	0.25		
Ca_Posttest	Between Groups	0.27	2	0.14	0.60	0.55
	Within Groups	30.24	131	0.23		
Na_Pretest	Between Groups	0.13	2	0.07	0.44	0.65
	Within Groups	20.20	131	0.15		
Na_Posttest	Between Groups	0.157	2	0.08	0.21	0.80
	Within Groups	47.19	131	0.36		
S_Pretest	Between Groups	0.04	2	0.02	0.11	0.90
	Within Groups	24.32	131	0.19		
S_Posttest	Between Groups	1.94	2	0.97	3.19	0.04
	Within Groups	39.88	131	0.30		
Phi_Pretest	Between Groups	0.387	2	0.19	0.56	0.57
	Within Groups	45.11	131	0.34		
Phi_Posttest	Between Groups	0.13	2	0.06	0.12	0.89
	Within Groups	72.65	131	0.55		

Table1. A one-way ANOVA revealed that there was a statistically significant difference in defined level in soil between at least two groups (F (2, 131), p = 0.68).

Fig 1: Rice planting/ Leguminous-crops rotation planting and nutrient soil testing

CONCLUSIONS

The legumes such as peanuts, soy beans and green beans, can increase both the macronutrients and secondary nutrients and improved the physical soil to suitable advantage for the nutrient to the rice in next planting as fresh plant fertilizers interspersed with the main crops such as rice. which are sustainable soil management for food security and better nutrition. Therefore, the issue of soil pollution solved using organic farming #03: the research on soils for better food nutrition, has one sample of the achieved contribute of SDG2, SDG and SDG- 15 to advance towards the achievement of the SDGs2030.

REFERENCES

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