



Soil properties in areas with organic rice cultivation and areas without organic rice cultivation Ban Sirpatiana, Ko Wang District, Yasothon Province

Location Kho Wang District, Yasothon Province

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Abstract

Title: A Comparative Study of Soil Properties Between Organic Rice Farming Areas and Non-Organic Rice Farming Areas in Ban Siri Phatthana, Kho Wang District, Yasothon Province. This study aims to investigate and compare the soil properties of areas used for organic rice cultivation and areas where organic rice is not grown. Soil samples were collected at a depth of 0–15 cm from the study sites. The analysis focused on comparing primary soil nutrients (Organic Matter, Phosphorus (P), and Potassium (K)), soil acidity-alkalinity (pH), and soil moisture content. The results indicated that the cultivation or absence of organic rice did not lead to significant differences in the chemical properties of the soil, specifically regarding primary nutrients and pH levels. However, in one organic rice plot, the levels of phosphorus and potassium were higher than in the non-organic areas, which may be attributed to inherent soil characteristics or specific fertilizer management practices within that plot. Regarding physical properties, the study found that organic rice cultivation resulted in a distinct decrease in soil moisture levels compared to non-cultivated areas. Keywords: Organic Rice, Soil Properties



Introduction

1.1 Background and Significance of the Problem Ban Siri Phatthana, Nam Om Sub-district, Yasothon Province, is a community where organic rice has been extensively cultivated in vacant areas over a long and continuous period. This is because local farmers recognize the importance and value of organic farming, as it serves as a significant source of income. However, this cultivation has primarily focused on economic returns without fully considering the long-term impact on soil properties.

Research Question

Are there any differences in soil properties between areas with organic rice cultivation and areas without organic rice cultivation, and if so, what are those differences?

Research Hypothesis

Soil properties in areas with organic rice cultivation and areas without organic rice cultivation are different.

Materials and Equipment

1. Soil Nutrient Test Kit (SOM, P, K): A portable analysis kit developed by Chiang Mai University and Maejo University.
2. Soil pH Test Kit: A test kit for measuring soil acidity and alkalinity.
3. Simple Soil Drying Oven: For measuring soil moisture content.
4. Precision Balance: OHAUS brand, CENT-O-GRAM model, with a capacity of 311g.

Research Methodology

1. Site Selection: Select two study plots consisting of an organic rice cultivation area and a non-organic rice cultivation area, both located within the same soil series.
2. Soil Sampling and Preparation: Collect soil samples using a random sampling method and prepare them for analysis.
3. Soil Nutrient Analysis: Analyze the prepared soil samples to determine the levels of primary soil nutrients, including Soil Organic Matter (SOM), Phosphorus (P), and Potassium (K)
4. pH Analysis: Analyze the soil samples to determine the acidity-alkalinity (pH) levels.
5. Soil Moisture Analysis: Analyze the soil samples to determine the soil moisture content.
6. Data Recording and Analysis: Record the test results, perform a comparative analysis, and formulate a conclusion.

Research Results

The study of soil properties in organic rice cultivation areas compared to non-organic rice cultivation areas in the study site at Ban Nam Om, Kho Wang District, Yasothon Province, yielded the following results

Soil properties	Area with organic rice cultivation	Area without organic rice cultivation
	Study area 1	Study area 2
Major nutrient content		
Organic matter	2.74 (relatively high)	2.12 (moderate)
Phosphorus (P)	18 (moderate)	12 (low)
Potassium (K)	59 +++ (low)	39+++ (very low)
Soil pH	5.2	6.4
Soil moisture (%)	17.07	16.37

Conclusion and Discussion

Based on the study of soil properties in the two designated areas—Area 1 (Organic Rice Cultivation) and Area 2 (Non-Organic Rice Cultivation)—it was observed that the cultivation of Organic rice influences certain chemical and physical properties of the soil. The findings are summarized as follows:

- Soil Organic Matter (SOM): The organic soil samples showed relatively high levels of organic matter.
- Phosphorus (P): The phosphorus content in the organic rice soil was found to be at a moderate level.
- Soil Acidity-Alkalinity (pH): The pH level of the organic soil was measured at 5.2.
- Soil Moisture Content: A difference was observed in moisture levels; the organic rice soil had a moisture content of 17.07%, while the conventional (non-organic) soil had a moisture content of 16.37%.

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References

- Figure 1: Study Site 1: Organic rice cultivation area and non-organic rice cultivation area at Ban Siri Phatthana. Source: Google Earth (2025)
Figure 2: Study Site 2: Organic rice cultivation area and non-organic rice cultivation area at Ban Siri Phatthana. Source: Google Earth (2025)

References / Related Literature

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