

Comparison of soil properties in the self-sufficiency garden area and waste incineration chimney at Phak Mai Wittayanukul School.



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Abstract

This research aims to compare the chemical and physical properties of soil between areas where waste is burned and areas where crops are cultivated. Soil samples were collected from both areas at Phak Mai Wittayanukul School and analyzed for pH, major nutrients (nitrogen, phosphorus, and potassium), moisture content, color, and texture.

The results show significant differences between the two soil types. The cultivated area has an average pH of 7, which is more suitable for plant growth than the chemical waste area, which has an average pH of 5. Furthermore, the amount of major nutrients, especially phosphorus, is three times higher in the cultivated area compared to the chemical waste area. The amounts of nitrogen and potassium differ by approximately 15% and 10%, respectively. In terms of physical properties, the soil in the cultivated area has an average moisture content of 25% by weight, which is higher than the chemical waste area's average moisture content of only 12% by weight. The soil structure is also more friable, as evidenced by the noticeable differences in soil texture and color.

The results indicate that cultivation has a positive impact on soil quality, particularly by increasing the optimal pH and the amount of essential nutrients, which are crucial for plant growth. These findings can be used as a guideline for managing and restoring chemically depleted soil to its fertility and sustainability.

Research Question and Hypothesis

- How do the chemical properties of the soil in land incineration chimney areas differ from those in self-sufficient garden areas?
- How do the physical properties of the soil in land incineration chimney areas differ from those in self-sufficient garden areas?
 - The chemical properties of the soil in land incineration chimney areas differ from those in self-sufficient garden areas.
 - The physical properties of the soil in land incineration chimney areas differ from those in self-sufficient garden areas.

Introduction

Soil is a vital natural resource essential for the survival of humans, animals, and plants, especially in agriculture, which relies on soil for cultivation and nutrients. Maintaining soil quality to ensure it is fertile and suitable for plant growth is therefore of paramount importance. However, soil degradation is a continuous problem caused by various factors, one of the most significant direct impacts on soil is open burning of waste.

Research Methods and Materials



- Soil tomometer
- Soil nutrient test kit (N, P, K)
- Mobile phone
- Shovel
- Pencil and pen
- Notepad
- Test tube stand
- Soil sample container



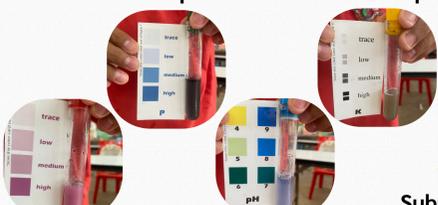
Define study points.



- Define study points.
- Collect soil samples from designated locations.
- Test the soil properties.
- Compare the two types of soil in various aspects.
- Submit the data to the program: <https://www.globe.gov>



Collect soil samples and measure temperature and humidity.



Test the soil properties.

Submit the data to the program: <https://www.globe.gov>

Study Point	pH value	Nitrogen	Phosphorus	potassium
A	5	high	high	high
B	7	medium	low	low

Results

In this study, researchers collected soil samples from two areas:

- A: a landfill chimney
- B: a self-sufficient garden.

The soil properties, including soil color, soil moisture, soil texture, pH, and the amount of major nutrients such as nitrogen (N), phosphorus (P), and potassium (K), were then analyzed. The results of the analysis are summarized in the following table.

Results recording table

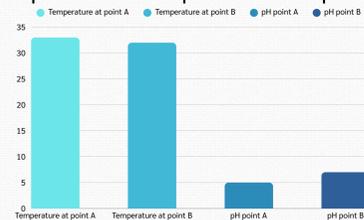
1. Soil Chemical Property Recording Table

Study Point	pH value	Nitrogen	Phosphorus	potassium
A	5	high	high	high
B	7	medium	low	low

2. Table for recording the physical properties of the soil.

Study Point	Soil color	Soil moisture	Soil texture	Temperature (C)
A	ดำคล้ำ	WET+	แน่นทึบ	33
B	น้ำตาลอ่อน	WET+	ร่วนซุย	32

3. The graph shows a comparison of temperature and pH values.



Summarize and discuss the research findings

In conducting the research project titled "Comparison of Soil Properties in Waste Incineration Areas and Sufficiency Economy Garden Areas," students followed a systematic research process, starting with defining the research topic, reviewing relevant literature and research, planning the operation, preparing equipment, and collecting soil samples from the two areas.

The soil samples were then analyzed to compare soil properties including color, texture, soil moisture, pH,

and the amount of major nutrients: nitrogen (N), phosphorus (P), and potassium (K).

The results showed that the soil in the cultivated area was loose, light in color, had an optimal pH level (approximately 7),

and had moderate levels of NPK nutrients, suitable for plant growth. In contrast, the soil in the waste incineration area,

was dense, dark in color, had a low pH (approximately 5), indicating high acidity, and had excessively high levels of plant nutrients, clearly unsuitable for plant cultivation.

This research also reflects the impact of inappropriate waste management practices that can significantly alter soil properties, potentially leading to long-term degradation of cultivated areas.

Therefore, promoting the reduction of waste burning by the public is crucial.

Adopting proper waste management methods, such as waste sorting, composting, and recycling, is a crucial approach to maintaining the quality of soil and the overall environment.

Bibliography

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