Title: Study of soil quality in a forest garden of 3 types, 4 benefits at Wichianmat School, Trang Province

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Abstract

Environmental research on soil moisture measurement in the forest 3 types, 4 benefits The objectives of the research are to study soil structure, soil texture and soil color, soil pH, soil temperature, soil minerals and soil moisture. From the study, it was found that from the results of the soil moisture measurement experiment in the forest 3 types, 4 benefits at Wichianmat School, it was found that the soil structure around the fan palm is a loose and friable type, dark brown in color, the soil texture is a red sandy clay loam, the soil structure around the eucalyptus is a loose and friable type, the soil is dark brown in color, the soil texture is a red sandy clay loam, the soil structure around the teak tree is a compact soil type, the soil is light brown in color, the soil texture is a red sandy clay loam. The average temperature of the fan palm is 24.7, the average temperature of the eucalyptus is 25, the average temperature of the teak tree is 25.3, the average moisture of the fan palm is 43, the average moisture of the eucalyptus is 57, the average moisture of the teak tree is 23. The average pH of the fan palm is 5.7, the average pH of the eucalyptus is 4.3, the average pH of the teak is 2.7. In conclusion, the temperature at the teak tree is the highest, the humidity at the eucalyptus tree is the highest, and the pH at the fan palm tree is the highest.

Introduction

Background and Importance

Forests under the royal initiative of "3 Forests, 4 Benefits" are very important for maintaining and restoring the forest ecosystem to be complete and sustainable. The origins and importance are as follows:

Origins and importance Maintaining the balance of the ecosystem Moisture in the forest is an important factor that controls the balance of the forest ecosystem. If the moisture is not appropriate, it will affect the growth of plants, the survival of wild animals, and the functioning of microorganisms in the soil. Forest fire prevention Forests with high moisture are less at risk of forest fires than forests with low moisture. Therefore, moisture monitoring is an important tool for preventing and controlling forest fires. Soil and water conservation Forests with appropriate moisture will help absorb rainwater and prevent soil erosion. Therefore, moisture monitoring helps conserve soil and water. Promoting forest growth Trees in the forest need appropriate moisture to grow. Moisture monitoring will help us know the moisture conditions in the forest and plan forest management appropriately.

3 Forests, 4 Benefits with Moisture

Utilitarian forests: Moisture monitoring helps us know the moisture conditions that are appropriate for the growth of fast-growing trees, such as bamboo and giant acacia trees, which are trees used in daily life.

Edible forests: Moisture monitoring helps us know the moisture conditions that are appropriate for the growth of fruit trees and various vegetables, which are a food source for the people.

Economic forests: Moisture testing helps to determine the moisture conditions that are suitable for the growth of economically valuable woods such as teak and rubber trees, which are a source of income for the people.

Research Questions

Are there 3 types of forests with 4 benefits that have different types of plants and different soil quality?

Hypothesis

Hypothesis 1 Soil quality in 3-type forests with 4 benefits with different plants and different quality

Independent variable: 3-type forests with 4 benefits with different plants

Dependent variable: Soil quality, soil texture, soil color, pH, soil temperature, soil minerals, and soil moisture

Controlled variable: Measurement method, measurement time, instrument

Materials and Instruments

- hoe
- NPK meter
- Soil moisture meter
- PH meter
- Soil map

Research Methodology

1. Set up soil study points in the forest area of 3 types, 4 benefits in Wichianmat School with 3 different types of plants: fan palm, eucalyptus tree and teak tree.
2. Test soil samples at 3 points, each point from the soil under the base of a different type of tree by using a hoe to dig the soil in the specified area 10 centimeters.
3. Measure soil moisture using a soil moisture meter, wait for the value to stabilize and record the results.
4. Measure pH using a pH meter, wait for the value to stabilize and record the results.
5. Measure soil minerals using an N P K meter, wait for the value to stabilize and record the results.
6. 4. Measure soil texture, soil structure and soil color using a soil texture classification manual by touch method.

Research Results

Table 1 shows the characteristics of soil structure, soil color and soil texture.

Study Sites for Soil	Soil Structure	Soil Color	Soil Texture
Fan Palm	Soil Cohesion	Dark Brown Soil	Silty Clay Loam
Eucalyptus	Soil Cohesion	Dark Brown Soil	Silty Clay Loam
Teak	Soil Compaction	Light Brown Soil	Silty Clay Loam

Table 2 shows the temperature in the forests of 3 types and 4 types with different plant species.

Temperature Test Results (Celsius)				
Study Sites for Soil	Trial 1	Trial 2	Trial 3	Average
Fan Palm	25	23	26	24.7
Eucalyptus	26	25	24	25
Teak	27	25	24	25.3

Table 3 shows the pH values in the forests of 3 types and 4 types of benefits with different plants.

Acidity and Alkalinity (pH) Study Results				
Study Sites for Soil	Trial 1	Trial 2	Trial 3	Average
Fan Palm	6	5	6	5.7
Eucalyptus	4	5	4	4.3
Teak	3	2	3	2.7

Table 4 shows the moisture content in the forests of 3 types and 4 types of benefits with different plant species.

Soil Moisture Study Results (%)				
Study Sites for Soil	Trial 1	Trial 2	Trial 3	Average
Fan Palm	40	50	40	43
Eucalyptus	50	60	60	57
Teak	20	20	30	23

Table 5 shows the minerals in forest soil, 3 types, 4 types of benefits from different plants.

Study Sites for Soil	Nitrogen (N)	Phosphorus (P)	Potassium (K)
Fan Palm	1	2	6
Eucalyptus	6	6	20
Teak	1	2	4

Conclusion and Discussion

The study found that from the results of the experiment on soil moisture measurement in the 3 types of forests, 4 types of benefits at Wichianmat School, it was found that the soil structure around the fan palm is a loose and friable type, dark brown in color, the soil texture is a red sandy clay loam type. The soil structure around the eucalyptus tree is a loose and friable type, the soil texture is dark brown, the soil texture is a red sandy clay loam type. The soil structure around the teak tree is a compact soil type, the soil texture is light brown, the soil texture is a red sandy clay loam type. The average temperature of the fan palm is 24.7, the average temperature of the eucalyptus is 25, the average temperature of the teak tree is 25.3, the average moisture of the fan palm is 43, the average moisture of the eucalyptus is 57, the average moisture of the teak tree is 23, the average pH of the fan palm is 5.7, the average pH of the eucalyptus is 4.3. The average pH of teak trees is 2.7. In conclusion, the temperature at teak trees is the highest, the humidity at eucalyptus trees is the highest, and the pH at fan palm trees is the highest.

Recommendations

In the next project, soil quality, moisture, minerals and fertility can be found in the soil, such as soil moisture of each tree, minerals and soil conditions, fertility of that area, so that they can be compared and used for further study.

Acknowledgements

May this project be successful. I would like to thank Director Sakda Paisomboon for supporting equipment and funding. I would like to thank Teacher Khwanjai Kanchanasrimek and Teacher Thamolwan Boonchuay for their advice and consultation until this project was successful. I would like to thank the Botanical Garden of Wichianmat School for providing knowledge about soil testing methods and making this research successful.

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Appendix