Compare Quantities Biomass and Carbon Storage of RRIM 600 Rubber Trees 6 years, 10 years old, and 19 years old.

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THE GLOBE PROGRAM
Global Learning and Observations to Benefit the Environment

Abstract

The purpose of this study was to compare the carbon sequestration of RRIM 600 rubber trees in Moo 7, Thung Khai Subdistrict, Don Ta Khao District, Trang Province by measuring soil temperature. Soil pH Soil moisture value Soil fertility values to determine the N P K value of rubber tree height to compare the carbon sequestration of RRIM 600 rubber trees.

Keywords : pH Paper , N P K Test Kit , Clinometer , RRIM 600 Rubber Tree, Carbon Sequestration, Carbon Dioxide

Research Question

1. How does the carbon sequestration capacity of 19-year-old RRIM 600 rubber trees compare to that of 6-year-old and 10-year-old trees in terms of magnitude?

2. How does the soil quality of 19-year-old RRIM 600 rubber trees, which affects carbon sequestration, differ from that of 6-year-old and 10-year-old trees?

Introduction

Thailand is one of the countries where rubber is widely cultivated, especially in the southern region, which has a suitable climate and terrain. Rubber is not only an important economic crop that helps generate income for the country, but it also plays a role in sequestering carbon in the soil and in the wood, which reduces the amount of carbon dioxide in the atmosphere. This is the main cause of global warming. There is latex in the bark of the stem. When the rubber tree grows to about 6-7 years old, it can be cut to use latex. It has economic value, making it the main raw material for the production of natural rubber.

In addition to its economic uses, rubber also plays an important role for the environment, especially in terms of absorbing and storing carbon dioxide to reduce global warming. However, an important factor that may affect the carbon sequestration efficiency of rubber trees is the age of the trees, so this project aims to compare how the quality of different ages of the soil affects the carbon sequestration of rubber. The carbon sequestration amount is compared over the life span of different rubber to obtain useful information for the sustainable management of rubber plantations both economically and environmentally.

Research Methods

A Study on Carbon Sequestration in Rubber Trees in Southern Thailand RRIM 600 strain, which is in the Planting area is approximately the same. There are 3 age groups, namely 6, 10 and 19 years old.10*10 m.

Some features of the soil in rubber plantations Sampling at a depth of 10 and 20 centimeters, 6 samples/plot at each depth to analyze soil particles, N P K content, acidity-base content and soil moisture.

Zone	Geographical Coordinates	
	Latitude (N)	Longitude (E)
RRIM 600 Rubber Tree at 6 Years of Age	7.4362680	99.6642760
RRIM 600 Rubber Tree at 10 Years of Age	7.4344418	99.6726106
RRIM 600 Rubber Tree at 19 Years of Age	7.4349412	99.6728363

GLOBE Measurement Methods
Soil Measurement Methodology (Pedosphere Soil)
Vegetation Cover Measurement Methodology (Biosphere)

Rubber trees in southern Thailand RRIM 600 strain, which is in the Planting area is approximately the same. Soil samples were collected in the rubber plantation area of 6 years 3.5 rai, 10 years 2.5 rai and 19 years 4 rai by randomly collecting each year in an area of 10*10 m with a depth of 10 centimeters and 20 centimeters at 6 points of depth each.

Materials and equipment

1. Florence flask
2. Funnel
3. Filter paper
4. Beaker
5. Glass stirring rod
6. Dropper
7. Aluminum foil
8. Distilled water
9. Digital weighing scale
10. Measuring spoon
11. pH Paper
12. NPK test kit
13. Clinometer
14. Rapitest Digital 3-Way Soil Analyzer
15. 3-in-1 soil moisture meter

GLOBE Badges

1. I AM A DATA SCIENTIST

The project was carried out using a process based on data collection principles, analysis, and conclusion to ensure accuracy and reliability. The approach included problem formulation, systematic scientific data collection (e.g., random sampling), and data analysis using statistics to compare the means of different variables. The data was processed using Excel to calculate the averages and standard deviations (S.D.) to enhance the reliability of the results for comparison. Graphs and charts were used to visualize trends and differences in the data. A bar chart was used to display the relationship between the age of rubber trees and the results, which were presented in the form of a bar graph for comparison.

2. I AM A COLLABORATOR

This work was the result of collaboration among several parties, including the research team, the advising professor, and relevant organizations. It highlights the importance of being a good collaborator and working as a team. The research team, composed of three students, collectively planned, designed the experiments, collected data, analyzed the results, and drew conclusions. The advising professor played a key role in providing guidance on the research process, sample collection methods, and data analysis. Collaboration with other organizations, such as the support from the school, which provided the budget, equipment, and academic assistance, as well as the cooperation of farmers and the community who provided information on the rubber tree plantation area and allowed the research to take place, was crucial to the success of this project.

3. I MAKE AN IMPACT

The current issue of rubber cultivation faces declining prices from latex production. Studies on other roles of rubber trees have shown that they play an important role in reducing the amount of carbon dioxide in the atmosphere, which is a major cause of global warming. Additionally, local communities can generate income from rubber trees by assessing the amount of carbon dioxide absorbed and calculating the revenue from carbon offset credits. Rubber plantations can be developed into voluntary carbon credit trading projects, similar to other forestry sectors, as they are effective carbon sinks both in the trees and in the soil. Moreover, the management practices in rubber plantations help reduce carbon loss throughout the lifespan of the trees, which is long enough to support carbon trading contracts.
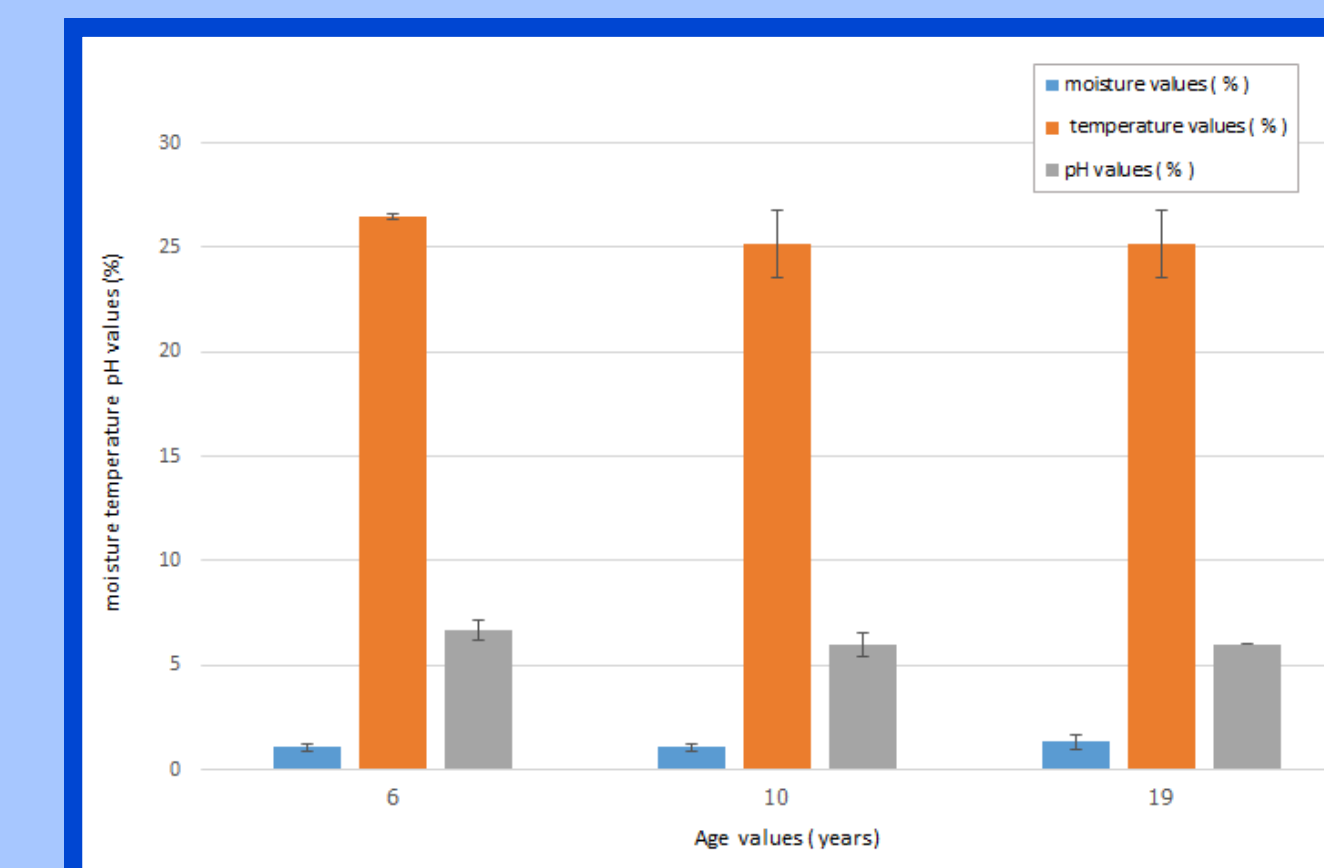
Results

Analyzing Data

Chart 1 Comparetem moisture temperature pH values of RRIM 600 rubber trees 6,10,19 years.(Soil depth 10 cm)
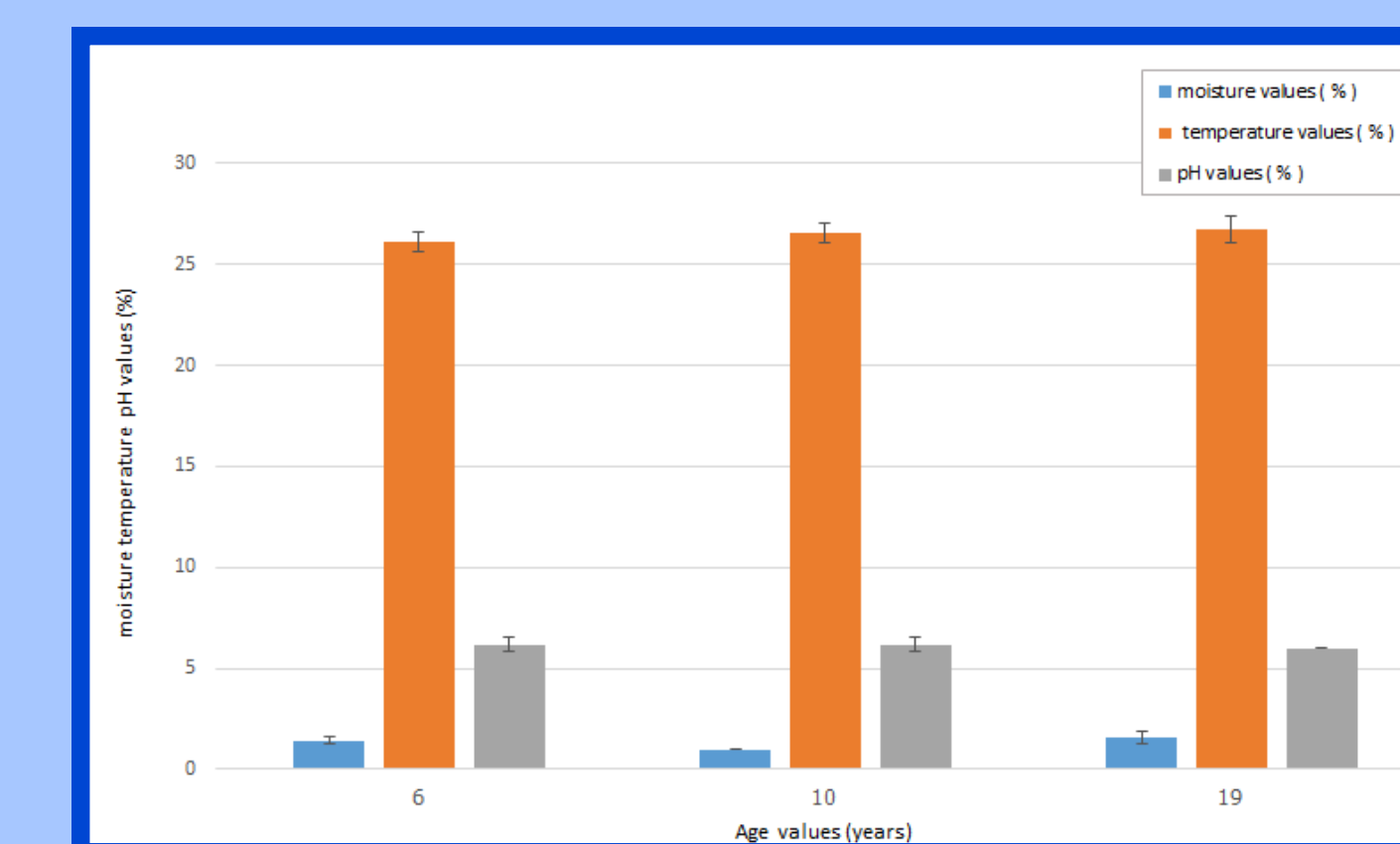
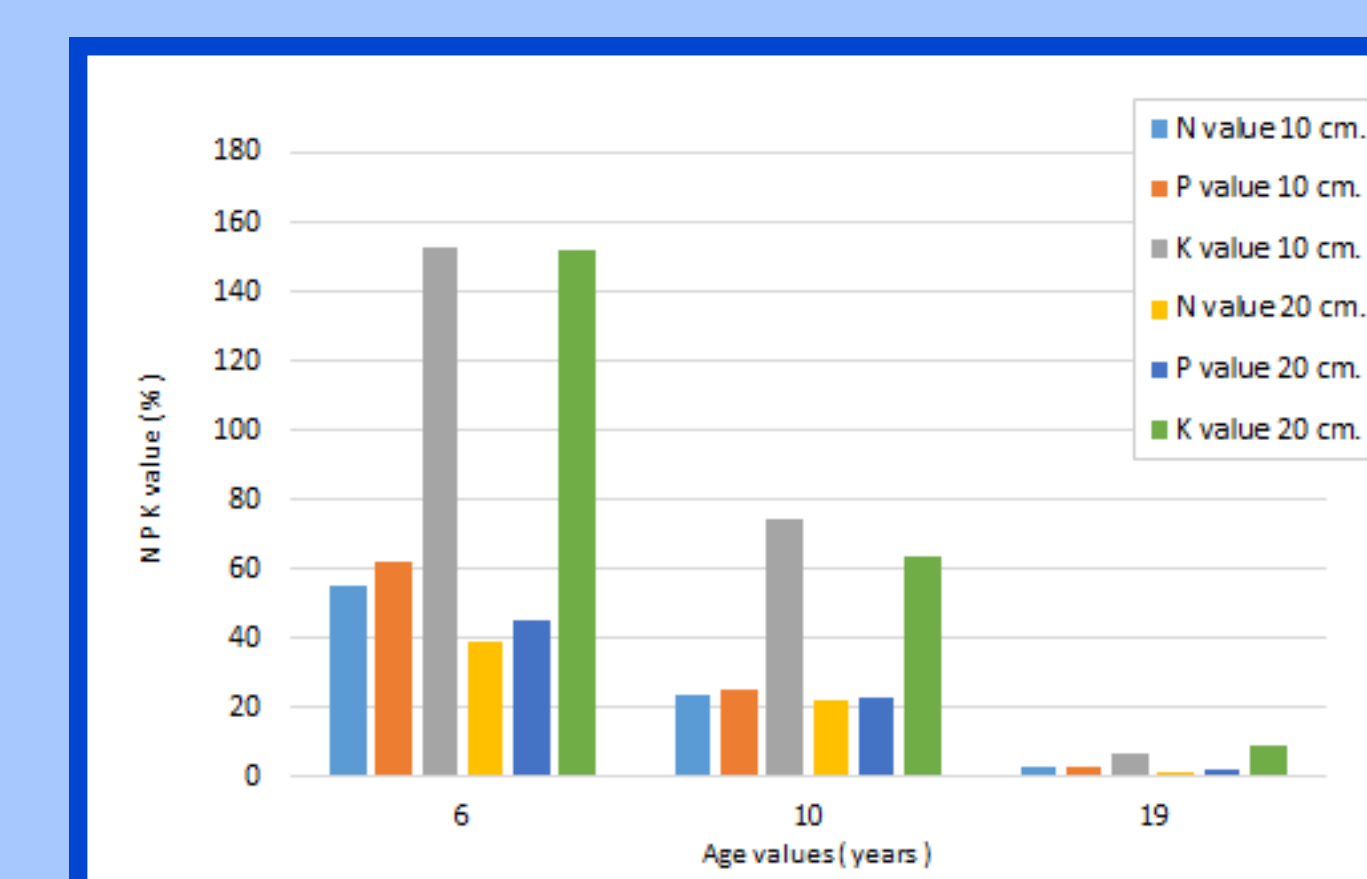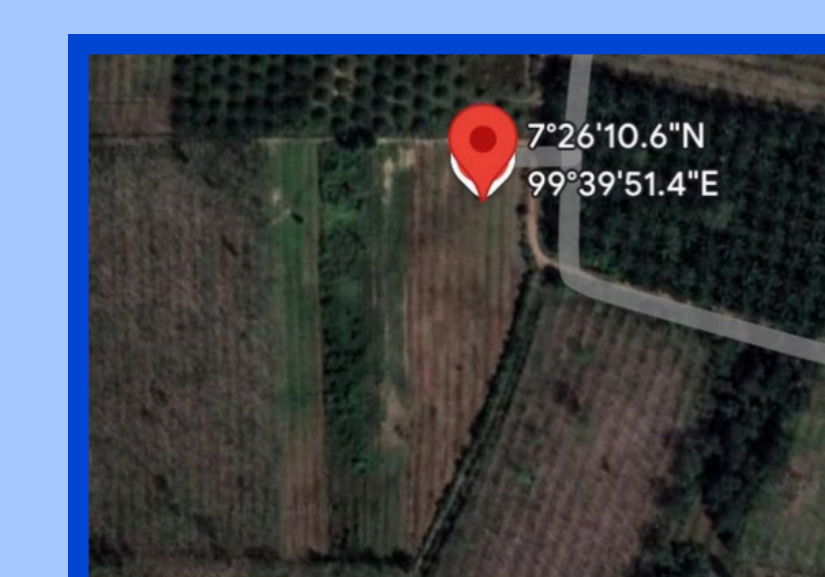Chart 2 Comparetem moisture temperature pH values of RRIM 600 rubber trees 6,10,19 years.(Soil depth 20 cm)
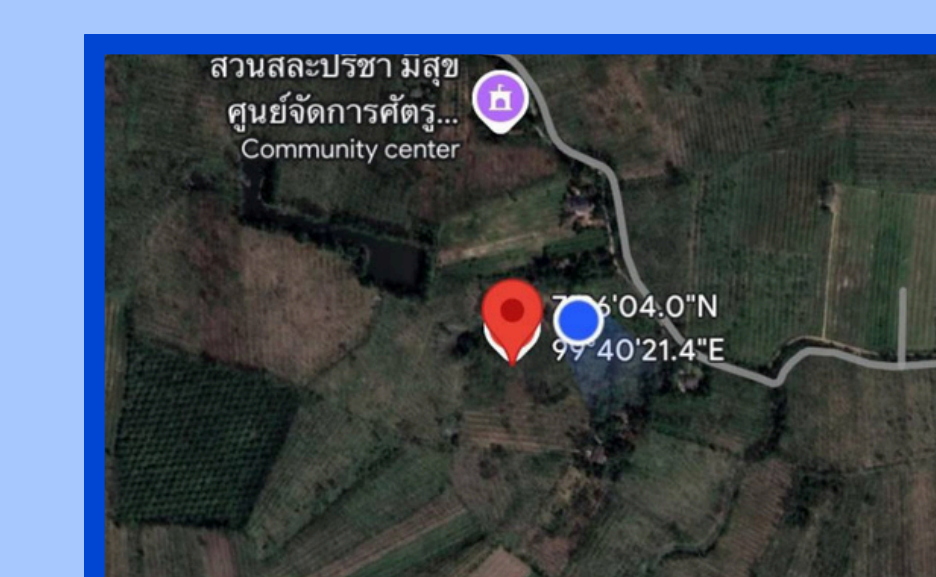
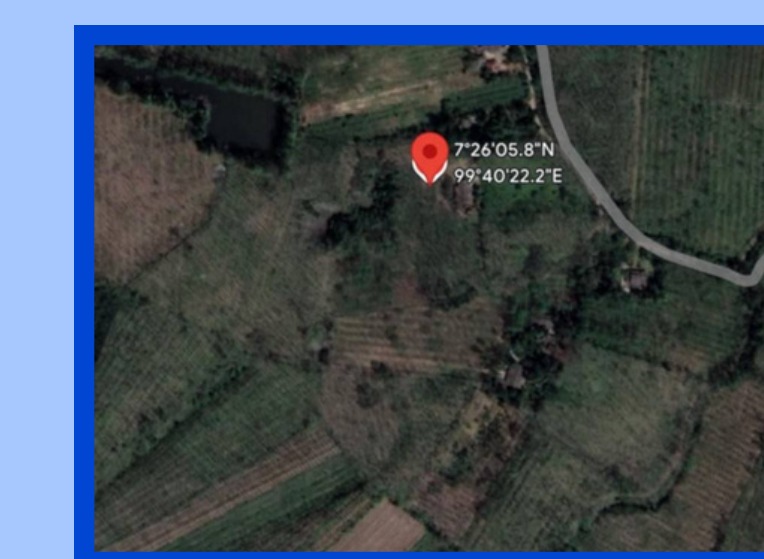Chart 3 Comparetem N P K values of RRIM 600 rubber trees 6,10,19 years

Map of Study Site

RRIM 600 Rubber Tree at 6 Years of Age

RRIM 600 Rubber Tree at 10 Years of Age

RRIM 600 Rubber Tree at 19 Years of Age

Discussion

Interpreting Data

1. Total Carbon Storage Volume

The 19-year-old RRIM 600 rubber tree has a higher total carbon sequestration than the 10-year-old RRIM 600 rubber tree and the 6-year-old RRIM 600 rubber tree with the lowest carbon sequestration, which is in line with Jintana Bangchan and Soonsri Yingchachawan, 2006.

2. Some properties of rubber plantation soils are randomly analyzed for soil samples at a depth of 0-10 and 10-25 cm.

Conclusions

Drawing Conclusions & Next Steps

The carbon sequestration of 201 KgCO2/rai of RRIM 600 rubber trees at 19 years old is different from the assessment of the carbon content from the biomass of rubber over the 25-year life span of the rubber and found that it can be assessed as 30.99 KgCO2/rai

The results of the analysis of some properties in rubber plantation soil at a depth of 0-10 cm and 10-20 cm showed that the rubber plantation soil was 6, 10 and 19 years old. The characteristics of the clay are loamy, sandy and floury. The soil moisture value of 19-year-old rubber is the highest at 13.3 and 26.75 %, while the pH value is in the range of 6-6.67 with acidity.

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