Comparative Study of Soil Quality in Mixed Gardens Growing Coconuts and Durian in Trang Province Thailand



Research Team: Miss Suchanan Pangchit

Miss Suchanat Noodum

Miss Netsara Yimtraiporn

# Abstract

This environmental research focuses on comparing soil quality in mixed gardens growing coconuts and durian in Khosaba Subdistrict, Nayong District. The study examines soil moisture, pH level, temperature, and nutrient composition in areas where coconut and durian trees are grown. The results indicate that the soil moisture under durian trees is higher than under coconut trees. The average pH levels of the soil in both areas are the same. The temperature under coconut trees is higher than under durian trees. Regarding soil nutrients, the average nitrogen (N) and phosphorus (P) levels are equal for both coconut and durian trees, while the average potassium (K) level is higher in the soil under coconut trees than under durian trees.

# Introduction

At present, agriculture remains closely connected to Thailand. As the world continues to develop, technological advancements and new perspectives have emerged to enhance productivity and create benefits for those in the agricultural sector. Integrated farming has become a method that adds value forfarmers, allowing them to cultivate crops efficiently on their own land.

In Na Yong District, most farmers prefer mixed farming. For example, the mixed farming of Aunt Saiyut, who grows Dimocarpus Longan and durian. Before growing Dimocarpus Longan , she had grown durian first, but many of the durian trees died and it was risky to grow only Durian. So she looked for other types of fruit to grow with the remaining durian. It turned out that the Longan produced good products which showed that the soil also affects the agricultural products.

Therefore, the researchers are interested in studying the physical characteristics of the soil, soil moisture content, soil pH, and soil nutrients in mixed orchards in Khok Saba Subdistrict, Na Yong District, TrangProvince. The purpose is to apply the knowledge from research on the relationship between durian andcoconut in mixed orchards and the impact of soil quality on the crops' growth and encouraging farmers to do the mixed cultivation. And it will increase and diversify income throughout the year, enabling farmers toutilize resources efficiently and reduce the risks from fluctuating products' prices.

# **Research Question**

Soil quality, soil moisture, soil pH, temperature, and soil nutrients are different between coconut and durian cultivation areas.

# Research Hypothesis

How do soil quality, soil moisture, soil pH, temperature, and soil nutrients differ between coconut and durian cultivation areas.

# Variables

Independent Variables: coconut cultivation area, durian cultivation area

Dependent Variable: Soil quality

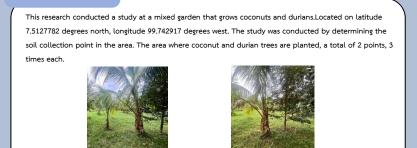
Controlled Variables: 1. Time of soil quality measurement 2. Method of soil quality measurement

# Advisors: Mrs Kwanjai Kanjanasrimek

Mrs Sutheera Thacheen

# School: Wichienmatu, Trang Province Thailand

# Study Locations



Coconuts

#### Durian

# Research Methdology

1.) Determine sampling points: Select two points in the mixed garden area where coconut and durian trees are planted. Collect soil samples from each point, with three samples taken at each point.

2.) Study the physical characteristics of the soil: Examine the soil structure using the CU SmartLens. Study the soil texture and color by comparing them with the soil color book.

 Measure soil temperature at all points: Use a soil thermometer to record the soil temperature. Collect data from two points, three times at each point.

ata from two points, three times at each point.

4.) Measure soil moisture at all points: Use a multifunctional meter to measure the soil moisture content. Collect data from two points, three times at each point.

5.) Measure NPK values in the soil at all points: Use an NPK tester to measure the nutrient content in the soil. Collect data from two points, three times at each point

# **Research Findings**

Soil in the mixed orchard at Khok	Soil Moisture Contest					
Saba Subdistrict, Na Yong District, under study	First time	Second time	Third time	Aveng		
Area under the coconut tree	10	10	10	10		
Area under the durian tree	10	10	29	13.3		

Soil in the mixed orchard at Khok Saba Subdistrict. Na Yong District, under study	pH values			
	First time	Second time	Third time	Averag
Area under the coconut tree	6	7	6	6.33
Area under the		,		6.33

Picture2 Show the pH value under the durian tree and under

onut tree with the same average effe

Picture1 Show the average soil moisture value. The area under the durian tree has higher humidity than under the coconut tree.

Soil in the mixed orchard at Khok Saba Subdistrict, Na — Yong District, under study	Soil temperature values (°C)				
	First time	Second time	Third time	Average	
Area under the coconut tree	28	29	27	28	
Area under the durian tree	27	28	27	27.33	

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Picture3 Show the average temperature of the area under the coconut tree is higher than the durian tree.

Picture4 Show the average soil nutrients of the two areas with the same amount of (N) and (P) and (K) in the area under the durian tree is less than under the coconut tree.

# Acknowledgment

Preparation of environmental research on comparing soil quality in mixed gardens that grow coconuts and durian in Khok Saba Subdistrict, Nayong District. The preparation team studied for information and conducted experiments on making this project as well as making a project book. Received advice from the advisor teacher in doing the project. Including ideas as well as various defects that need to be solved I would like to thank Mr. Sakda Paisomboon, director of Wichian Matu School for supporting and helping Mrs. Kwanjai Kanjasrimek and Mrs. Sutheera Thacheen for providing useful advice throughout the operation period. It also suggests solutions in areas that should be improved to make the project more complete. Make this project complete.



## Discussion and conclusions

Soil moisture The area under the durian tree has a higher humidity value than the area under the coconut tree. Which is consistent with the nature of durian that requires more water and humidity than coconut to grow. The pH-base of the soil under the durian tree and under the coconut tree is the same average. Which is classified in the small to neutral acidity range Suitable for growing both coconuts and durian The soil temperature under the coconut tree has a higher than the area under the durian tree. This may be due to the characteristics of the bush shape of the coconut tree. Causing sunlight to shine more sunlight to the ground more densely bushed durian Nitrogen (N)and phosphorus (P) in the soil nutrients in the soil under the coconut tree and durian tree have the same average. Which shows the balance of macronutrients in similar soil in both areas Soil and fertilizer management that may be similar characteristics Potassium (K) under the coconut tree is more than under the durian tree this may be the result of the residue of leaves and coconut shells that decompose into nutrients.

Thank you to yourteammates for helping to exchange opinions as well as giving useful suggestions in the development of this project. The organizers sincerely hope that this project will be beneficial to those who are interested and can be applied or expanded in the future.

### References

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