

**Research Title:** Comparison of Soil Quality with Vetiver Cover and Brazil Nuts

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### **Abstract**

Comparison of Soil Quality with Vetiver Cover and Brazil Nuts at Wichienmatu School, Trang Province, the objectives were to compare the soil quality covered with vetiver and Brazil nuts at Wichienmatu School, Trang Province by collecting soil samples from the area where vetiver is grown and the area where Brazil nuts are grown at Wichienmatu School, Trang Province. to analyze and compare soil quality such as nutrient values N, P, K, soil moisture values, and acidity-alkalinity values, the results of the study showed that areas covered by both types of plants have different effects on soil quality. The soil covered by vetiver has nutrient values N, P, K in the soil, better soil moisture, and neutral acidity-alkalinity values. As a result, the quality of the soil with vetiver cover is better than the soil with the Brazil nut cover.

**Keywords:** Vetiver, Brazil nuts, soil quality

### **Introduction**

Soil is a natural resource that is important for the ecosystem and human livelihood because it is a source of nutrients, a water reservoir, and a base to support plant growth. The quality of the soil, therefore directly affects the fertility of the area. If the soil is degraded, the plant will grow poorly. There is erosion of the soil surface and causes the soil

to lose its ability to be used sustainably. Covering the soil with plants is one way to help conserve and improve soil quality. The soil cover reduces the impact of raindrops. Reduce erosion retains moisture and increases organic matter from plant residues, resulting in soil that is suitable for the growth of plants and soil organisms. Vetiver is an important plant for soil conservation because it has a deep and dense root system, can hold the soil well, reduce soil erosion, and can also thrive in a variety of environments. Brazil nuts are legumes that can fix nitrogen from the air through the root knots. It helps to increase the amount of nitrogen nutrients in the soil, making the soil fertile. Wichienmatu School where the land is used for learning activities and planting crops. Comparing the soil quality in areas covered with vetiver grass and Brazil nuts will help to know the effects of each soil cover plant, such as nutrient values N, P, K, soil moisture, acidity, and light concentration.

The research team then studied a comparison of soil quality covered with vetiver and Brazil nuts in Wichienmatu School. will be a guide for choosing the right soil cover plants to improve and conserve soil quality in a sustainable manner and can be applied to other areas.

### **Objective**

- To compare the quality of soil covered with vetiver and Brazil nuts at Wichienmatu School, Trang Province.

### **Research Question**

- The soil cover of vetiver and Brazil nuts in Wichienmatu School, Trang Province affects soil quality. Is it different or not?

### **Research Hypothesis**

- The soil cover of vetiver and Brazil nuts at Wichienmatu School, Trang Province affects different soil quality.

### **Materials, equipment and methods of conducting research**

#### **Related Variables**

**Hypothesis :** Soil cover of vetiver and Brazil nuts at Wichienmatu School, Trang Province Does it affect the nutrient values N, P, K, soil moisture value, and acid-alkalinity value?

**Early variants:** Types of ground cover plants include vetiver grass, Brazil nuts.

**Variables based on:** Soil quality includes nutrient values N, P, K, soil moisture values, and acidity-alkalinity values.

**Control variable:** duration of study The area to be studied, the amount of water used for irrigation.

### **Materials and equipment**

1. Universal Indicator
2. N P K Soil Meter
3. Soil moisture meter
4. Tape measure
5. Pink shaped bottle
6. Glass Rod
7. Filter paper
8. Petri dish
9. Beakers
10. Google maps
11. Distilled water

### **Designate study points**

Wichienmatu School, Trang Province

### **Geographical coordinates**

Table 1 shows the geographical coordinates of Wichienmatu School.

| Latitude   | Longitude   |
|------------|-------------|
| 7.50439° N | 99.62835° E |

## How the research was conducted

### Soil quality measurements include:

1. Measurement of nutrients N, P, K in soil
2. Soil moisture measurement
3. Measurement of acidity and alkalinity in soil

## Part 1 To compare the quality of soil cover with vetiver and Brazil nuts at Wichienmatu School, Trang Province

### 1. Research preparation process

The research preparation process includes: 4 steps are to set up a study topic and choose the topic you want to study. The study collected knowledge and theories related to the research, determined the purpose of the study, and determined the random sampling points in the study area. This research compares the soil quality with vetiver and Brazil nut cover by the method. The measurement of nutrient values N, P, K, soil moisture, and acidity-alkalinity values in areas covered by vetiver and Brazil nuts was measured in 1 area divided into 2 areas of 3 points each, for a total of 6 points, which were separated into 1. Vetiver grass cover 2. Brazil nut cover.

### 2. Implementation Stages

#### 2.1 Measurement of nutrients N, P, K in the soil

Soil samples were collected from all areas to be studied. Weigh a sample of dry and sifted soil, bring 20 grams, pour into the beaker, add 20 ml of distilled water to get a 1:1 soil to water ratio. Use a glass stick to stir the soil for 30 seconds, then let it rest for 3 minutes, repeat the same thing 5 times .

2.1.1 Measuring Soil Fertility with a Soil Test Kit (Soil Nitrate Nitrate) Using a pipette, 2.5 mL of soil solution is suctioned and inserted into a test tube. Add 1 sachet of HI 3895-N reagent to the soil solution. Close the lid of the test tube and shake for about 30 seconds, allow the chemical to dissolve, then compare the resulting color to the nitrate content color comparison plate.

2.1.2 Measuring Soil Fertility with Soil Test Kit (Soil Phosphorus) Using a pipette, suck 2.5 ml of soil solution into a test tube and add 1 sachet of HI 3895-P reagent to the soil

solution. Close the test tube lid and shake for about 30 seconds, allowing the chemical to dissolve. Then compare the resulting color with the phosphorus content color comparison plate.

2.1.3 Measurement of soil fertility with a soil test kit (potassium in the soil) Using a pipette, suck 0.5 ml of clay solution into a test tube. Add 2.5 ml of distilled water and add 1 sachet of HI 3895-K reagent to the soil solution. Close the test tube lid and shake for about 30 seconds, allowing the chemical to dissolve. Then compare the resulting turbidity with the potassium content comparison plate.

## 2.2 Soil moisture measurement

Measure the temperature and moisture in the soil at all points. By using a soil moisture meter.

At a depth of 5 centimeters, soil moisture readings are read. by collecting data 5 times.

## 2.3 Soil acidity-alkalinity measurement

Measure the acidity and alkalinity in the soil at all points. By weighing a sample of dry and sifted soil, 20 grams are poured into a beaker, and 20 ml of distilled water is added to obtain a soil:water ratio equal to 1:1. Stir the soil for 30 seconds with a glass stick, then let it rest for 3 minutes, repeating the same thing 5 times. Leave it until the soil in the beaker settles, you can see clear water at the top, then take a measurement.

## Findings

Comparison of Soil Quality with Vetiver Cover and Brazil Nuts in Wichienmatu Provincial School Trang has the following results:

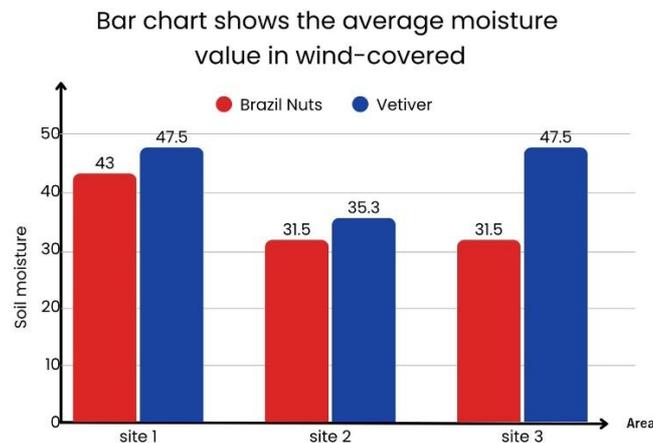
**Part 1: To compare the quality of soil cover with vetiver and Brazil nuts at Wichienmatu School, Trang Province.**

Table 2 shows the average nutrient abundance in each area of the soil.

| Area        | Average nutrient fertility in the soil |        |        |
|-------------|--|--------|--------|
|             | N                                      | P      | K      |
| Vetiver     | Medium                                 | Medium | Hight  |
| Brazil Nuts | Medium                                 | Low    | Medium |

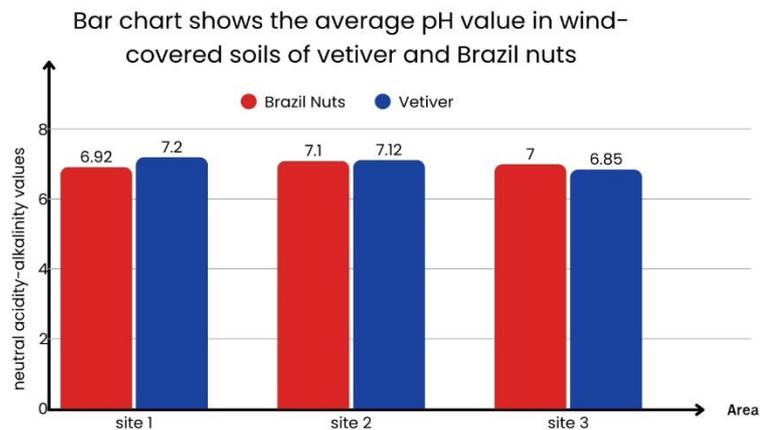
Table 2 shows the average nutrient fertility value in each area of the soil. It was found that the areas covered by vetiver were more fertile than those covered by Brazil nuts, and the areas covered by vetiver were high in potassium and moderately rich in phosphorus and nitrogen. The area covered by Brazil nuts is moderately rich in nitrogen and potassium, and very little phosphorus is present.

Chart 1: Bar chart shows the average moisture value in wind-covered soils of vetiver and Brazil nuts.



From Chart 1: the bar chart shows the average moisture values in wind-covered soils of vetiver and Brazil nuts. It was found that soils covered with vetiver have an average soil moisture value higher than soils covered with Brazil nuts.

Chart 2: Bar chart shows the average pH value in wind-covered soils of vetiver and Brazil nuts.



From Chart 2: the bar chart shows the average acidity-alkalinity value in soils covered with vetiver and Brazil nuts, it is found that soils covered with vetiver and soils covered with Brazil nuts have the same neutral soil acidity-alkalinity values.

### Summary and discussion of research findings

Based on the study and comparison of soil quality with vetiver cover and Brazil nuts at Wichienmatu School, Trang Province in the area where the study was conducted found to be based on the hypothesis of vetiver and Brazil nuts. It affects the nutrient values N,P,K in the soil and the moisture value in the soil, resulting in different soil quality. It was found that soils covered with vetiver have nutrient values of N, P, and K in the soil than soils covered with Brazil nuts. The soil moisture value is higher than that of the soil that is covered with Brazil nut cups. It was found that the soil covered with vegetation cover both types had the same neutral acidity-alkalinity value and better than the soil is covered with Brazil nuts.

### Suggestions

1. The research results can be used to manage and conserve soil within the school.
2. Further research should be conducted to compare with other ground cover plants.
3. Soil quality should be continuously monitored and evaluated to see the results of long-term changes.

## Acknowledgments

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