Resistance Characteristics of Soil Fertility

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Abstract. Fertile soil is an important indication to support plant growth. The more fertile a soil then plant growth, the better. In this study, the method used is to measure the resistance of different types of fertilizer are manure, compost. Because different forms of land then the resistance will also vary according to the shape of the land. The results obtained are cage fertilizer that has the smallest resistance is 39.7 Ω and 33.6 Ω whereas compost and 35.4 Ω 41.9 Ω. The benefits of this method were to determine the resistance or resistance from the ground. So the lower the ground obstacles, the more fertile the land. Conversely, the higher the resistance of the soil, the more the soil is not fertile.

Keywords: Barriers, Different, Resistance, Ω

INTRODUCTION

The production of agricultural businesses per unit area is determined by the level of fertility of the soil, the more fertile a ground it will get better plant growth. Because, soil fertility is the value of the quality of soil's ability to provide nutrients for the growth of plant species in an amount sufficient and balanced if the other growth factors such as light, temperature, humidity, and soil physical profitable. In desperate need of plant growth nutrient and functions within the plant cannot be replaced with other elements, so that if in the soil elements are not in sufficient quantities plants cannot grow normally. Plant nutrients can come from soil, water, and air. Based on the total requirement for plant growth, nutrients are divided into macronutrients and micronutrients. Nutrients are elements of nutrients required in large quantities such as C, H, N, P, K, Ca, Mg, and S. Whereas the micronutrient elements are nutrient elements needed by plants in small amounts, among others, Fe, Mn, B, Mo, Cu, Zn, Cl, and Co. The content of nutrients in the soil and the soil's ability to provide nutrient elements for plant growth vary. So this type of fertilizer is given for each type of soil will be different and depends on type of plants that cultivated. To determine fertilizer needs and the type of fertilizer needed for each type of soil is necessary to study soil fertility evaluation. This study can be obtained by analysis of soil and plant analysis, field trials, and the pots in the greenhouse experiment. Analysis of soil and plant aims to determine the availability of nutrients in the soil and the lack of nutrients for plant growth.

MATERIALS AND METHODS

Tools and Materials
Material need to be prepared are two samples of different fertilizers. One sample and one sample of compost manure. The tools used in data collection called digital Multimeter, wire, and cable.

Data Collection Methods
After preparation tools and materials have been done, the next step was to capture the data. The process of data collection is used Resistance method to measure the resistance to objects. The principle of this tool is current withstand a certain amount depending on the value of the resistor component, with variation measurements, two times and retrieval of data being in the laboratory space with room temperature of 32°C obtained the data in Table 1.

Table 1. The results of data retrieval with resistance method.

Compost (Ω)	Manure (Ω)
41.9	39.7
35.4	33.6

Data Processing
The data processing method above is to determine the magnitude of the resistance of the material. With R is the resistance of the n and n is the number in retrieving data. While the average value of the resistance (can be obtained by the equation: $\overline{X}$)

$$\overline{\overline{X}} = \frac{\sum R}{n}$$

RESULTS AND DISCUSSION

Data Processing
Results processing 1. The table data to the equation above is shown in Table 2.

Table 2. Results of data processing.

Compost (Ω)	Manure (Ω)
38.65	36.65

The average value obtained from the data processing using the equation is 38.65 Ω to sample compost and 36.65 Ω for samples of manure. Based on the average of compost and manure can be seen the average gap data is 2 Ω, this indicates that the characteristics of compost and manure-based resistance are not much different.

Then the data in table 2 are substituted into Ms. Excel and obtained graphic 1.
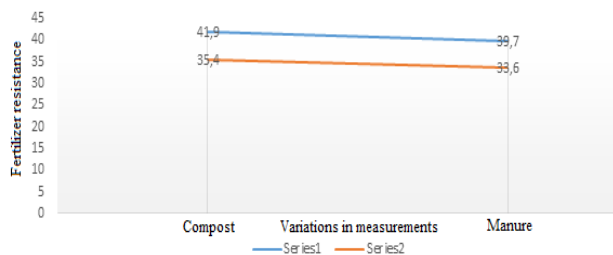
Figure 1. Chart resistance of Manure and Compost.

Data Analysis

Based on the results of data contained in the figure 1. can be concluded that the resistance of compost is higher than the resistance of manure. The lower the resistance of fertilizer, then the better the fertility. The above graph shows that the resistance of the manure is smaller than the resistance of compost. The resistance difference is influenced by several factors: soil nutrients (the composition of the soil), water, and land masses. The better the components of soil fertility, the level of the higher and the lower the resistance.

From the data contained in the above chart resistance of manure that is lower than the resistance of compost, the authors recommend the use of fertilizer is best used is manure.

Figure 1 shows samples of cooking oil saturated and unsaturated edible oils do not overlap, where the sample is saturated cooking oil is in the range of 1.6 whereas the range of unsaturated oil samples was in the range of 1.3 range. Such data can be clearly distinguished from the value of surface tension. Therefore, these data can be used as a basis for the manufacture of the detection system.

CONCLUSIONS

From the data processing, we can see the average value obtained using the equation is 38.65 Ω to sample compost and 36.65 Ω for samples of manure. It means compost and manure can be seen the average gap data is 2 Ω, that indicates the characteristics of compost and manure-based resistance are not much different.

From the result, it can be concluded that the resistance of compost is higher than the resistance of manure. The lower the resistance of fertilizer, then the better fertility. The graphic 1 (chart resistance and manure compost) showed that the resistance of the manure is smaller than the resistance of compost. Which is influenced by several factors: soil nutrients (the composition of the soil), water, and land masses. The better the components of soil fertility, the level of the higher and the lower the resistance.

Such data can be clearly distinguished from the value of surface tension. Therefore, these data can be used as a basis for the manufacture of the detection system.

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