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The Effectiveness Of Using Organic Waste As Compost Using Composter And Biopory Methods On The Growth Of Sawi Plants

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ABSTRACT

The waste produced by humans is increasing along with the increase in population. From the data from the Kediri Regency Environmental Service (DLH), at least in 2019 in Kediri Regency there were recorded 503 tons of waste. That is what is resulted from the activities of the community in one day. This study aims to analyze the differences in the use of kitchen waste as a biopore and composter for mustard plants. **T**he research method used is an experimental method, using a RAL research design (Completely Randomized Design). The data analysis technique used is One Way Anova and General Linear Model. The results of the research that has been carried out using the Anova test results obtained a significant value <0.05 so that it can be concluded that there is an effect of adding composter to the growth of height and number of leaves of mustard plants. Meanwhile, in the GLM test of mustard plant height, a significant value was obtained <0.05 so that it was concluded that the addition of composter and biopori affected the growth of mustard plants with different doses, but did not determine the height and number of leaves on mustard greens. From the research that has been done, it is concluded that biopori compost and composter are effective to be applied to mustard plants. So it is hoped that the biopori and composter methods can be applied by the community in an effort to reduce household organic waste as compost.

Keywords : biopores, Composter, Garbage

INTRODUCTION

The waste produced by humans is increasing along with the increase in population. If there is no human awareness to process it, then waste will become a serious problem. (Hartono, 2012)

Indonesia is estimated to produce 64 million tons of waste every year. Based on data from the Ministry of Environment and Forestry (KLHK) in 2019, the composition of waste is dominated by organic waste, which reaches 60% of the total waste. Plastic waste occupies the second position with 14%, followed by 9% paper waste and 5.5% rubber. Other waste consists of metal, cloth, glass, and other types of waste.

According to data from the Kediri Regency Environment Agency (DLH), at least in 2019 there were 503 tons of waste in Kediri Regency. It is the result of community activities in one day. Its volume is equivalent to an area of 3,162 cubic meters. The largest composition of organic waste is 60.1 percent, in the second position is plastic waste, which is

19.2 percent, and the rest are other types of waste (Jawa Pos Radar Kediri, February 21, 2020) Land problems are a very complex problem because of community resistance to the existence of landfills, especially those located around residential areas. (Soma, 2010).

Thus, it is necessary to make an effort to overcome one of them with the 3R principle. Waste management with 3R principles has been established as a National Strategy in the Regulation of the Minister of Public Works Number 21/PRT/M/2006. The first principle is to reduce waste generation at the source (reduce), reuse materials so that they do not become waste (reuse), and recycle materials that are no longer useful into other materials that are

more useful (recycle). In addition, the application of the 3R principles in waste management can also provide economic benefits for the community, one of which is through the composting business. (Subandriyo, Anggoro, & Hadiyanto, 2012)

In the midst of increasingly limited land for traditional waste processing, this household scale composter can be made with the aim of processing kitchen organic waste into compost. In manufacturing it is easier because it only modifies the finished material which is cheaper in the market and can be used many times because it is made of durable plastic and also the fertilizer produced by composter trash cans can be sold to farmers and the general public.

In addition to processing waste using the composter method, the Biopori Infiltration Hole also functions as compost processing. (Mulyaningsih, Purwanto, & Sasongko, 2014). In the journal (Widyastuty, Adnan, & Atrabina, 2019) Biopori Respan holes can help reduce the vulnerability of cities to floods, droughts due to lack of water sources and help reduce the burden of organic waste. So that the Biopore Infiltration Hole is appropriate to be applied to locations that have a density of buildings and population settlements.

One of the villages in Kediri Regency, namely Punjul Village, has the potential of natural resources, which are mostly found in agriculture and fisheries, so that the use of fertilizers is beneficial to provide and provide various kinds of nutrients in the soil, so that the soil will become fertile and the plants will grow. grow optimally and can be applied to plants.

METHODS

The research method used is the experimental method, with a design RAL study (Completely Randomized Design). With the research design in this study using 4 treatments of composter and biopori fertilizers, namely 100 gr, 150 gr, 200 gr, 250 gr and one was not given compost (control). Data analysis using Anova and General Linear Models.

RESULTS

a. Anova Test

After passing the normality and homogeneity test, it means that the data has met the prerequisites of the test One Way Anova, then the data will go through One Way Anova, The purpose of this study was to determine whether there was an effect of adding EM4 to rabbit urine liquid fertilizer on the growth of celery plants caused by each treatment as stated in the research hypothesis. Here is the test result data One Way Anova:

Table 1. The results of the ANOVA test are high and the number of leaves of mustard plants with the use of bioporous fertilizer

	Sig.
Height_Plant_Biopore	0.000
Number_Leaves_Biopore	0.017

Based on table data 4.22 ANOVA test results are high and the number of leaves of the mustard plant is 5 WAP, it can be seen that the significance value is 0.000 or the sig value. < 0.05 and 0.017 or sig. < 0.05 . So it can be concluded that there is an effect of adding biopori fertilizer on the growth of height and number of leaves of mustard plants for 5 WAP.

Table 2. ANOVA test results high and the number of leaves of mustard plants with the use of composter

Perlakuan_Biopori		N	Subset for alpha = 0.05	
			1	2
dimension1	Perlakuan 0	5	6,4080	
	Perlakuan 4	5		8,9480
	Perlakuan 1	5		9,7800
	Perlakuan 2	5		9,8960
	Perlakuan 3	5		10,3760
	Sig.		1,000	,174

Based on the table above, it shows that from all doses of biopore fertilizers, the results are similar so that it does not show a difference in dose in plant height for the use of biopore fertilizers. So that treatment 1 with a dose of 100 g is more effective because it requires the least cost.

Table 3. The results of the ANOVA test are high and the number of leaves of mustard plants with the use of composter

	Sig.
Komposter_Plant_Height	0.000
Amount_Leaf_komposter	0.019

Based on table data 4.24 ANOVA test results are high and the number of leaves of the mustard plant is 5 WAP, it can be seen that the significance value is 0.000 or the sig value. < 0.05 and 0.019 or sig. < 0.05 . So it can be concluded that there is an effect of adding composter to the growth of height and number of leaves of mustard plants for 5 WAP.

b. GLM (General Linear Model) Test

Table 4. GLM test results for mustard plant height

	Sig.
Treatment	, 762
Repetition	, 000
treatment x repetition	, 054

Based on the data in table 4.25, the GLM test results for mustard plant height 5 WAP, it can be seen that the significance value is 0.000 or the sig value. <0.05 in repetitions, which means that only different doses can affect the growth of mustard plants, while composter and biopori do not determine the growth of mustard plant height.

Table 5 GLM test results the number of leaves of mustard plants

	Sig.
Treatment	, 204
Repetition	, 001
treatment x repetition	, 179

Based on the data in table 4.26, the GLM test results for mustard plant height 5 WAP, it can be seen that the significance value is 0.001 or the sig value. <0.05 in repetitions, which means that only different doses can affect the growth of mustard plants, while composter and biopori do not determine the number of leaves of mustard plants.

DISCUSSION

a. To Identify The Effectiveness Of Using Kitchen Waste In The Manufacture Of Biopori On Mustard Plants.

Based on the results of the analysis using the ANOVA test, it can be seen that the height and number of leaves of mustard plants with the use of biopori fertilizers has a sig value. < 0.05 and 0.017 this means reject H0 which gives the result that there is an effect of using kitchen waste in the manufacture of biopori on the growth of mustard plants.

According to (Sutanto Rachman, 2002) the test results of height and number of leaves of mustard plants have variations in the value of high growth. This is caused by several factors, including the growing environment, climate, leaves, each of which has a role in photosynthesis, and excessive use of fertilizers. Biopori fertilizer with a concentration of 250 grams which has the lowest plant height and number of leaves due to the use of Excessive fertilizers cause the soil to harden and the plants to become stunted.

There is no small difference because the plant heights are not much different, so this has shown that the results of plant growth using commercial fertilizers and biopore compost showed similar results, therefore, the use of biopore compost can be used as one of the steps or innovations to produce compost. (Muh. Alwi Akbar, et al, 2018).

Biopore organic fertilizer had no effect on the relevant leaf number. This result was shown by the number of leaves, the results of using commercial fertilizers and biopori organic fertilizers were similar. These results show that biopore organic fertilizer has the potential to be developed in the process of cultivating and planting mustard plants. This is in accordance with the opinion of Suriadikarta et al.(2006).

For this study, the use of biopori compost with different doses had the same high growth yield and the number of leaves of mustard plants. Even though the use of biopori fertilizer with a dose of 250 g produced the highest value, it did not show a significant effect, for that it is better to plant at a dose of 100 g because it requires less cost and can grow more mustard plants.

b. Identifying The Effectiveness Of Using Kitchen Waste In Composting For Mustard Plants

Based on the results of the analysis using the ANOVA test, it can be seen that the height and number of leaves of mustard plants with the use of composter fertilizer has a sig value. 0.000 and 0.019 < 0.05 this means rejecting H0 which gives the result that there is an effect of different doses of kitchen waste in making compost on mustard plant growth.

This is in accordance with the opinion of Suwarsono, (1980) in the journal Ngantung, JAB, et al, (2018) which states that each fertilizer treatment will have a different growth impact, because plants will respond in various ways to changes in their surroundings that affect growth. the.

The presence of sufficient nitrogen elements will increase leaf growth and high amounts of nitrogen elements accelerate the conversion of carbohydrates into proteins which are then converted into protoplasm, Anonymous (2006).

For this study, the use of composter with different doses has high growth yields and the number of leaves of mustard plants are similar so that the use of composter with a dose of 100 g is more effective because it requires less cost.

c. Analyzing The Difference Between The Use Of Kitchen Waste In Making Biopore Compost And Composting Of Mustard Plants

Based on the results of the analysis using the GLM test, it can be seen that the height and number of leaves of mustard plants with the use of composter x biopori fertilizer on repetition has a significant value of 0.000 or sig value. <0.05, this means that it has the effect of giving different doses on the growth of mustard plants. The experimental results showed that the effect of biopori fertilizer and composter did not give a significant difference to the growth and yield of mustard plants.

The results of this experiment are in line with research conducted by (Arancon, et al 2006) which showed that the effect of organic fertilizers did not give a significant difference to the growth and yield of mustard greens (Brassica rapa L.). Analysis statistically showed that the results were not significantly different, but the data showed that fertilizers were higher and effective on growth and yields as well as the RAE value of mustard plants.

The results of measuring the number of mustard leaves for each treatment of commercial fertilizer and biopore compost showed that the number of leaves for each treatment with commercial fertilizer and biopori compost had different variations. The use of biopori fertilizers with a concentration of 250 grams has the lowest number of leaves due to excessive use of fertilizers that can inhibit the growth of the plant itself. Biopori organic fertilizers have no effect on increasing the number of relevant leaves. This result has been shown by the number of leaves, the results of using commercial fertilizers and biopori organic fertilizers are similar. This is in accordance with the opinion of Suriadikarta et al.(2006).

The experimental results showed that the effect of biopori fertilizer and composter did not give a significant difference to the growth of mustard plants. For processing kitchen waste as organic fertilizer with biopori or composter, it is better to use the composter method because processing is easier and more efficient and does not require a large area of land.

CONCLUSION

Based on the results of the research that has been done, it can be concluded that:

1. The results showed that biopori compost was effective to be applied to mustard plants. The results showed that the best treatment for mustard production lies in the treatment of biopori compost with a concentration of 100 grams.
2. The results showed that composter was effective to be applied to mustard plants. The results showed that the best treatment for the production of mustard plants lies in the treatment of composter fertilizer with a concentration of 100 grams.
3. The experimental results showed that the effect of biopori fertilizer and composter did not give a significant difference to the growth of mustard plants. So that the biopori and composter methods can be applied as processing kitchen waste as organic fertilizer.

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