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AN MANAGEMENT ORGANIC FERTILIZER COCONUT COIL LIQUID AND CHICKEN CAGE INCREASE THE GROWTH AND PRODUCTION OF ALLIUM ASCALONICUM L

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ABSTRACT

This research was conducted at Jalan Pintu IV, Alley Pond Jaka, Padang Bulan, Medan, Medan Johor District, North Sumatra Province. This study used a factorial randomized block design with 2 factors studied and 3 repetitions where the first factor was liquid organic coconut fiber fertilizer (B), which consisted of 3 levels, namely B0 = without coconut coir liquid organic fertilizer B1 = 1.5 L/Plot, B2 = 3L/Plot. The second factor was chicken manure consisting of 4 levels, namely A0 = without chicken manure, A1 = 2 Kg/Plot, A2 = 4 Kg/Plot, A3 = 6 Kg/Plot. Chicken manure has a significant effect on all observed parameters while for its interaction it has a significant effect on the number of tillers parameter.

1. INTRODUCTION

Shallot (Allium ascalonicum L.) is one of the main vegetable commodities in Indonesia and has many benefits. Onions are included in the group of non-substituted spices which function as food seasonings and ingredients for traditional medicine. Based on data from The National Nutrient Database, shallots contain carbohydrates, sugars, fatty acids, proteins and other minerals needed by the human body (Waluyo and Sinaga, 2015).

Shallot production in North Sumatra Province in 2014 according to the Agriculture Service quoted from BPS (2017) was 7810 tons, while the need for shallots reached 66,420 tons. From these data, the production of shallots in North Sumatra is still far below demand. So to meet the needs of shallots, the government imports shallots from abroad. This low production is partly due to the non-optimal technical culture system in its cultivation (BPS, 2017).

One way to increase shallot production is to improve cultivation techniques and apply organic fertilizers (Laude and Hadid, 2007). The background to the use of coconut coir waste as organic solid and liquid fertilizer is the large number of coconuts used by the community in various kinds of processed food, including processed as an additional cooking spice which is widely used by the community without realizing that a large amount of coconut coir waste will be produced. The coconut husk itself is about 1/3 of the coconut. So far, the use of coconut fiber waste is still lacking, only some people use it as handicrafts.

Coconut coir can be used as an ingredient for the manufacture of liquid organic fertilizer, because coconut coir contains macro and micro nutrients. The nutrient content contained in coconut coir is: water 53.83%, N 0.28% ppm, P 0.1% ppm, K 6.726% ppm, Ca 140% ppm, and Mg 170% ppm (Jamilah Napitupulu and Marni , 2013).

According to Jamilah and Juniarti, (2014) stated that POC Crocober was very effective in being applied to plants, because the fertilizer had direct contact with the plants. Crocober POC applications have been carried out on chillies, strawberries and field rice. There was an increase in yield and quality of production of these plants.

Coconut coir contains nutrients from nature that are needed by plants, namely potassium (K), besides that it also contains other elements such as calcium (Ca), magnesium (Mg), sodium (Na) and phosphorus (P). . When coconut coir is soaked, the potassium in the coconut coir can dissolve in water to produce soaking water which contains K. Soaking water containing K is very good if given as fertilizer and a substitute for inorganic KCL fertilizer for plants (Sari, 2015).

Manurehas benefits that are very important to achieve great success in terms of agricultural cultivation and animal husbandry using organic patterns. The main purpose of using animal manure is not only aimed at fertilizing plants, but beyond thatnatural fertilizerproduced by livestock also have certain advantages to be processed as alternative feed for other livestock. For example, goat, sheep and

chicken manure can be fermented for catfish feed, or goat manure can be processed into alternative feed/food for all poultry (Samudro, 2014).

Based on the results of the analysis on chicken manure, it can be seen that the nutrient content contained in solid chicken manure, namely, N-total 1.72%; P2O5 1.82%; K2O 2.18% (Samudro, 2014).

2. METHODS

This research is doneat Jalan Pintu IV, Jaka Pond Alley, Padang Bulan Medan, Medan Johor District, North Sumatra Province. This study used a factorial randomized block design with 2 factors studied and 3 repetitions where the first factor was liquid organic coconut fiber fertilizer (B), which consisted of 3 levels, namely B0 = without coconut coir liquid organic fertilizer B1 = 1.5 L/Plot, B2= 3L/Plot. The second factor was chicken manure consisting of 4 levels, namely A0 = without chicken manure, A1 = 2 kg/plot, A2 = 4 kg/plot, A3 = 6 kg/plot. Observation parameters consist of:

a. Plant Height (cm)

Plant height was measured 2 weeks after planting. Plant height was measured from the base of the tuber to the tallest leaf of the plant. Measurements are carried out until harvest. Measurements were made at intervals of 1 week.

b.Number of Leaves (strands)

The number of leaves was counted at the age of 2 weeks after planting. The leaves are counted starting from the leaves on the main tuber dan leaves on tuber tillers. Measurements were carried out until harvest, with intervals of once a week.

c.Number of Saplings (saplings)

The number of tillers was counted at the age of 2 weeks after planting. Observations were made by counting the number of offspring that appeared. Observations were made until harvest. Counting the number of tillers was done at intervals of 1 week.

d.Tuber Weight Per Clump (g)

After a while the tubers are left on the plot. Tuber weightcan be calculated. The weight was weighed per clump and then totaled and then the results were averaged.

e. Tuber Weight Per Plot (g)

The weight per plot can be weighed after the tubers have been left a while on the plot. All plants in the plot were tied and then weighed all at once.

3. RESULTS AND DISCUSSION

Plant Height (cm)

The results of the statistical analysis showed that the administration of coconut fiber liquid organic fertilizer and chicken manure had a significant effect, but the interaction between coconut fiber liquid organic fertilizer and chicken manure had no significant effect.

Based on the results of the regression analysis, it is known that the relationship between chicken manure and plant height is expressed by the linear regression equation, namely: Y = 21.817 + 1.111A r = 0.9052.

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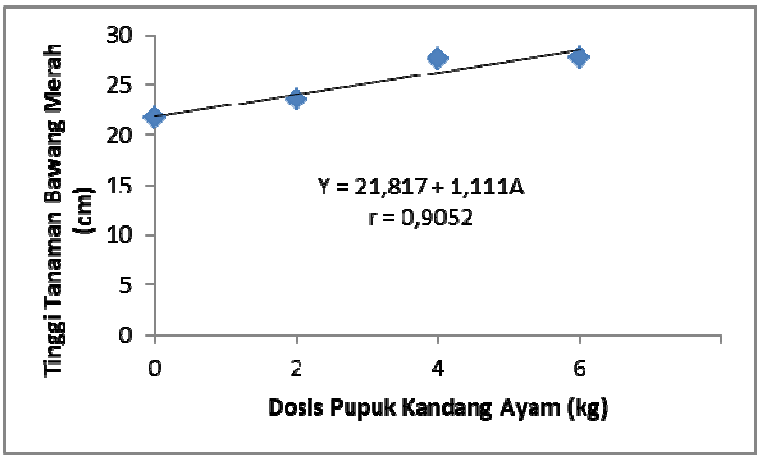

Figure 1. The relationship of chicken manure to plant height.

Based on the results of the regression analysis, it is known that the relationship between liquid organic coconut coir fertilizer and plant height is expressed by the linear regression equation, namely: Y = 22.323 + 1.88B r = 0.9357.

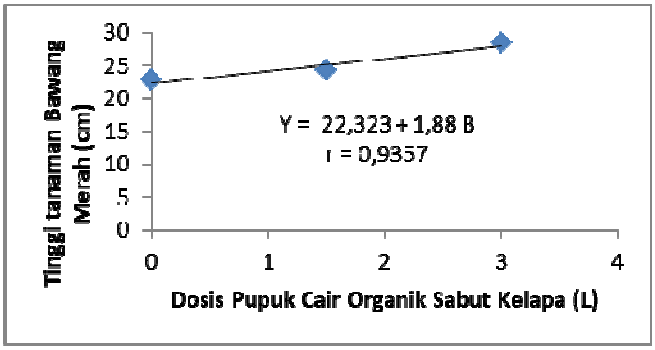

Figure 2. Relationship of Coconut Coir Liquid Organic Fertilizer to Height

Number of Leaves (strands)

The results of the statistical analysis showed that the application of coconut fiber organic fertilizer and chicken manure had a significant effect, but the interactions showed no significant different effect.

Based on the results of the regression analysis it is known that the relationship between chicken manure and the number of leaves is expressed by the quadratic regression equation, namely: Y = 11.343 + 3.2993 A – 0.3106 A2 r2 = 0.9898

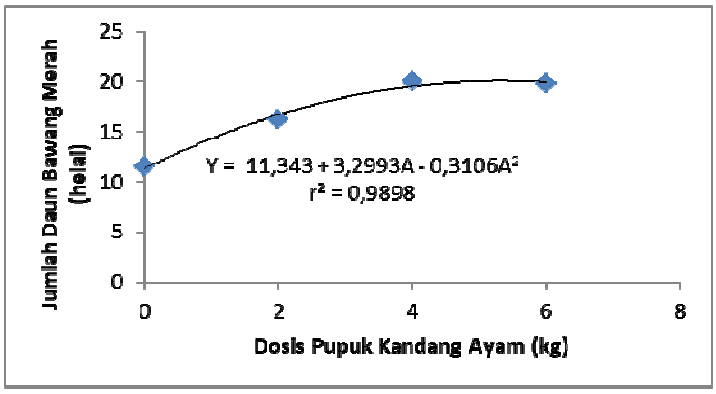

Figure 3. The relationship between chicken manure and number of leaves

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Based on the results of the regression analysis, it is known that the relationship between liquid organic coconut coir fertilizer and the number of leaves is expressed by the linear regression equation, namely: Y = 13.787 + 0.4443B r2 = 0.982

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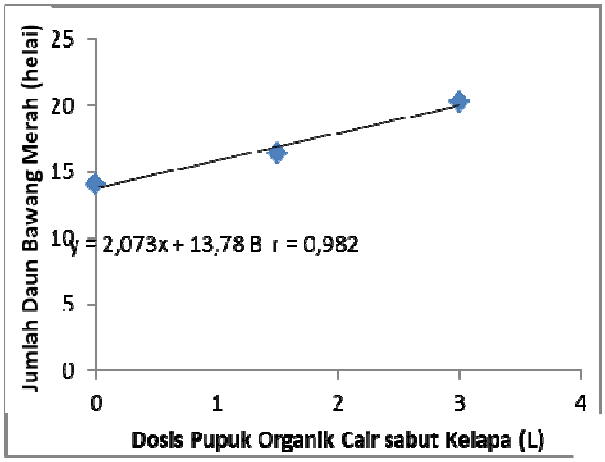

Figure 4. Relationship of Coconut Coir Liquid Organic Fertilizer to Number of Leaves

Number of Saplings (saplings)

The results of statistical analysis showed that the application of organic coconut fiber fertilizer, chicken manure and their interactions showed a significant effect.

Based on the results of the regression analysis, it is known that the relationship between chicken manure and the number of tillers is expressed by the quadratic regression equation, namely: Y = 3.0225 + 0.7662 A – 0.0706x2 r2 0.9061

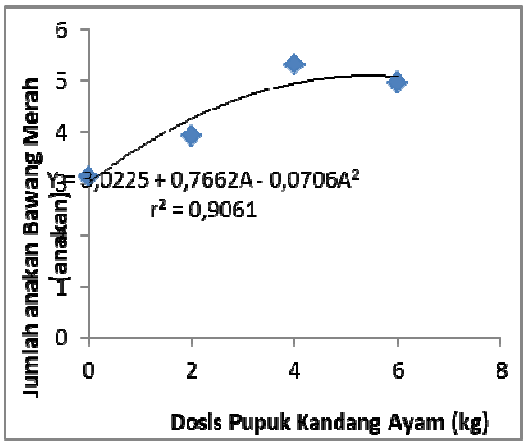

Figure 5. The relationship of chicken manure to the number of tillers

Based on the results of the regression analysis, it is known that the relationshi between coconut coir liquid organic fertilizer and the number of tillers is expressed by the quadratic regression equation, namely: Y = 3.59 + 0.1433 B r2 = 1

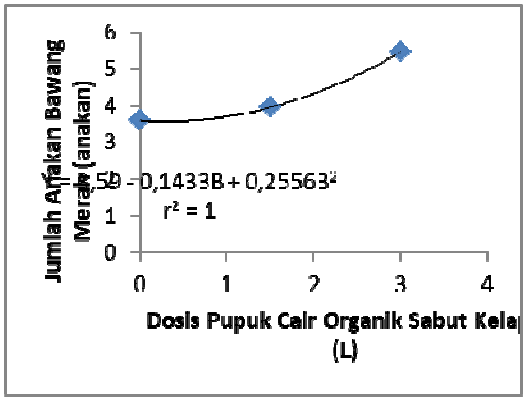

Figure 6. Relationship of Coconut Coir Liquid Organic Fertilizer to Amount Saplings.

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Based on the results of the regression analysis, it can be seen that the relationship between coconut fiber liquid organic fertilizer and chicken manure is expressed by the linear and quadratic regression equations, namely: Y = 2.1367 + 0.5 B r2 = 0.9935, Y = 2.2567 + 0.883 B r2 = 0.9556 , Y= 8.44 – 4.515 B + 1.265B2 r2 = 1 , Y= 1.2533 + 1.855 B r2= 0.9589,

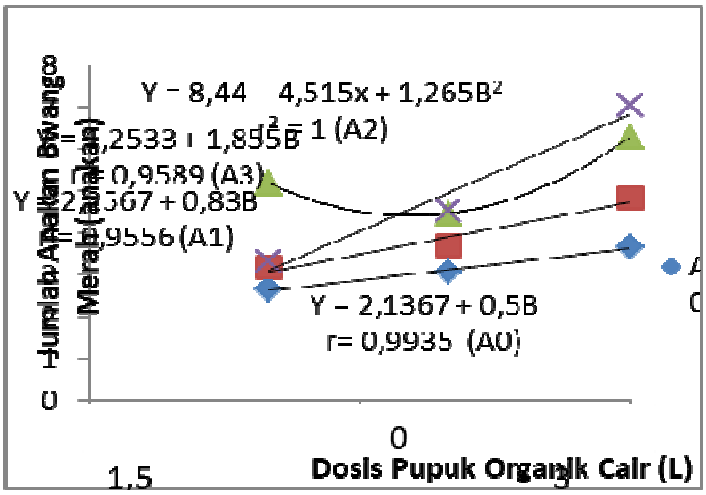

Figure 7. The interaction relationship between chicken manure and the number o illers

Based on the results of the regression analysis, it can be seen that the relati ship between coconut fiber liquid organic fertilizer and chicken manure is expressed by the linear and bic regression equations, namely: Y = 8.93 – 11.447 A + 6.065A2 – 0.8883A2 r2 = 1, Y = 1.9725 + 1.217 A r2 = 0.9742, Y= 2.565 + 1.157 A R2 = 0.9871.

Application of Coconut Coir Liquid Organic Fertilizer to the Growth and Production of Shallots (Allium ascalonicum L.)

The application of coconut coir liquid organic fertilizer had a very significant effect on all parameters observed. It is presumed that the dose of coconut coir liquid organic fertilizer given has met the needs of the plants. When viewed from the average growth and production, the application of liquid organic coconut fertilizer increased the average growth of each parameter observed when compared to without the application of liquid organic coconut fertilizer.

Statistically the administration of liquid organic coconut coir fertilizer showed a significant effect on all observed parameters, and based on the results of the regression analysis it was known that plant height was expressed by the linear regression equation, the number of leaves was expressed by the linear regression equation, the number of tillers was expressed by the negative quadratic regression equation, tuber weight per clump is expressed by a negative quadratic regression equation, tuber weight per plot is expressed by a linear regression equation. This is because liquid organic coconut coir fertilizer as organic fertilizer improves the physical properties of the soil, especially in improving soil structure so that air and water circulation will run smoothly and encourage plant growth. Besides that, it can also increase the availability of nutrients for plants.

This is in line with research conducted by Yunita Sabri, (2017) that the use of coconut coir liquid organic fertilizer has a significant effect on plant height, wet weight, dry weight of mustard plants (concentration of 125 mL liquid organic fertilizer coconut coir) is the best concentration.

Liquid organic fertilizer from coconut coir has a slightly acidic to neutral pH, where this condition is the best place for the development of microorganisms for the decomposition process (Tifani, 2012). Various microorganisms contained in liquid organic coconut coir fertilizer work in the soil so that it can improve the physical, chemical and biological properties of the soil. In liquid organic fertilizer coconut coir the highest nutrient is potassium (K). These nutrients play an important role in root development, helping the process of forming proteins and carbohydrates in plants (Mutryarny et al, 2014). Tifani (2012), stated that the application of organic coconut coir liquid fertilizer gave the best results on the number of tubers planted, fresh tubers planted and the weight of fresh tubers per plot.

The availability of sufficient nutrients for plant growth and production in the soil medium is used as a constituent of plant parts to obtain plant production. Ray Wijaya et al, (2015) explained that

nutrients absorbed by plants are used, among other things, to compose plant parts. The amount of nutrients needed to compose the plant parts is different for each type of plant, as well as for the same type of plant but different levels of production. In general, the plant's need for fertilizer is determined by the types of plant parts or the expected production. The expected crop production in the form of different crops. For example, plants that are cultivated for their leaves, such as vegetable plants.

4. CONCLUSION

The application of organic coconut coir liquid fertilizer showed significantly different effects on all parameters observed, namely plant height, number of leaves, number of tillers, tuber weight per clump, tuber weight per plot. The application of chicken manure showed significantly different effects on all observed parameters, namely plant height, number of leaves, number of tillers, tuber weight per clump, tuber weight per plot. The interaction of organic coconut coir liquid fertilizer and chicken manure showed a significant effect on the parameters of tiller number, tuber weight per clump, tuber weight per plot.

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