AN EFFECT OF ORGANIC COMPOSTING DUCK MANURE AND POC HOUSEHOLD WASTE ON PLANT PRODUCTION SHALLOT (Allium Ascalonicum L)

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ABSTRACT

Efforts to optimize the growth and productivity of shallot plants (Allium ascalonicum L) by applying organic compost of duck manure and POC of household waste. This research method used a factorial randomized block design (RBD) consisting of 2 treatment factors. The first factor was the application of duck manure organic compost (B), namely B0 = 0 g/planting hole, B1 = 50 g/planting hole, B2 = 100 g/planting hole and B3 = 150 g/planting hole. The second factor was the provision of POC for household waste (L), namely L0 = 0 ml/planting hole, L1 = 50 ml/planting hole, L2 = 100 ml/planting hole, L3 = 150 ml/planting hole. Parameters observed were the number of tillers (saplings), dry tuber weight per sample (g) and dry tuber weight per plot (g). The results showed that the application of duck manure organic compost had a very significant effect on the parameters of the number of tillers (saplings), dry production per sample (g) and dry production per plot (g). Where is the best treatment onB3 = (150 g/planting hole). PPOC distribution of household waste and their interactions had no significant effect on the parameters of the number of tillers (saplings), dry production per sample (g) and dry production per plot (g).

Keywords: Shallots, Duck Manure Compost, Household Waste POC, Production

INTRODUCTION

Shallot (Allium ascalonicum L) is a vegetable plant that has many benefits for human life, including as one of the horticultural crop commodities that is widely consumed by the public as a mixture of spices after chili. Besides being used as a mixture of spices, shallots are also sold in processed forms such as shallot extract, powder, essential oil, fried onions and even as a medicinal ingredient to lower cholesterol and blood sugar levels, prevent blood clots, lower blood pressure and improve blood flow. (Suriani, 2011).

Shallot production in North Sumatra in 2019 according to the Agriculture Service quoted from BPS (2020) was 18,072 tons, while the need for shallots reached 4,057 tons per month. From these data, shallot production in North Sumatra is still far below demand. To meet the demand for shallots, imports are carried out from abroad (BPS, 2020).

The organic matter contained in duck manure compost is useful in the mineralization process which will release nutrients completely (N, P, K, Ca, Mg, S and micronutrients) so as to increase the nutrient content of the soil. In addition, duck manure compost can also improve the physical and chemical properties of the soil, improve soil structure, make the soil lighter to cultivate, increase water resistance, improve soil permeability, and increase the capacity of cation exchange so that it can bind cations to a high level. with high doses of plant nutrients are not easily leached (Parnata, 2010).

Adding duck manure compost to the soil will affect the physical properties of the soil. The role of duck manure compost on soil physical properties includes stimulating granulation, improving soil aeration, and increasing water holding capacity. The role of duck manure compost on soil biological properties is to increase the activity of microorganisms that play a role in nitrogen fixation and the transfer of certain nutrients such as N, P, K, and S. The role

of organic matter in soil chemical properties is to increase cation exchange capacity so that it can affect nutrient uptake by plants (Djamaan, 2010).

Duck manure compost is classified as organic fertilizer with the nutrient content contained in duck manure compost dry matter (BK) 5.98%; nitrogen (N) 1.18%; P2O5 2.5%; K2O 1.00 %; CaO 0.50 %. Duck manure compost is one of the reasons for increasing the growth of a plant and can affect the nutrient content in plants (Zahmi, et. al, 2010).

POC household waste is a solution of the decomposition of organic materials originating from the remains of household waste such as plants and vegetables which contain more than one element of nutrients. POC household waste is the result of fermentation of various materials containing various kinds of amino acids, phytohormones and vitamins which play a role in increasing and stimulating the growth of microbes and soil rhizosphere. POC household waste also usually contains a lot of microbes that function to bind N and P and K solvents, increase levels of macro and micro nutrients naturally quickly which are needed by plants and the environment (Hamdani and Simarmata, 2012).

The POC content of household waste is quite complete, which contains macro nutrients nitrogen (N), micro elements (Fe, Mn, Cu, Zn, B, and Co), heavy metals (Pb, Cd, Hg, and As), bacteria and fungi, pH 3.3, and negative for pathogens E. coli and Salmonella sp. The levels of total macro N nutrients (1.05%), micro nutrients (Fe, Mn, Cu, Zn, B, and Co) and the pH of POC household waste are below the quality standard for organic liquid fertilizer, but the pH 3.3 still meets the quality standard. (Napu, 2011).

METHODS

This research was carried out in the research area atTelaga Jernih Village, Dusun A, Secanggang District, Langkat Regency and will be held from March to May 2021.
The materials used in this study were the bulbs of the Brebes bima onion plant, water spinach waste, citrus waste, sweet potato leaf waste, banana skin waste, duck manure, EM4, water, neem leaf vegetable pesticides.

The tools used in this study were hoes, tape measure, plastic straps, rulers, yells, stationery to record observational data, cameras for evidence of taking pictures. This study used a factorial randomized block design (RBD) which had 2 blocks.

The first factor is giving duck manure organic compost (B) namely B0 = 0 g/planting hole, B1 = 50 g/planting hole, B2 = 100 g/planting hole and B3 = 150 g/planting hole. The second factor is the provision of POC household waste (L), namely L0 = 0 ml/planting hole, L1 = 50 ml/planting hole, L2 = 100 ml/planting hole, L3 = 150 ml/planting hole. Parameters observed were number of tillers (saplings), dry tuber weight per sample (g) and dry tuber weight per plot (g).

RESULTS AND DISCUSSION

Number of Saplings (saplings)

The results of the statistical analysis of variance showed that the application of duck manure organic compost had a very significant effect on the number of tillers in shallot plants. Meanwhile, the administration of POC from household waste and their interactions had no significant effect on the number of shallot tillers at the age of 4, 5 and 6 weeks. After Planting (MST).

Table 1. Average Number of Chillers in the Administration of Organic Compost Duck Manure and POC Household Waste at the Age of 4, 5 and 6 Weeks After Planting (MST)

Treatment	Number of Saplings (saplings)		
	4MST	5 MST	6 P.S
B = Duck Manure Organic Compost			
B0 = 0 g/planting hole	4,27 d	7,72 d	10.23 d
B1 = 50 g/planting hole	4.64 c	8.41c	11.38c
B2 = 100 g/planting hole	4.83 b	10.02b	13,16 b
B3 = 150 g/planting hole	5,20 a	11.61 a	14,22 a
L = POC Household Waste			
L0 = 0 ml/planting hole	4.50a	9,13 a	11.41a
L1 = 50 ml/planting hole	4.59 a	9,19a	12.00 a.m
L2 = 100 ml/planting hole	4.72 a	9.59a	12.53 a
L3 = 150 ml/planting hole	5,13 a	9.84 a	13.05a

Table 1 shows that the highest number of tillers was found in the application of organic compost of duck manure B3 = (150 g/planting hole), namely 14.22 tillers and the lowest was in the treatment of B0 = 0 g/planting hole, namely 10.23 tillers. The highest number of tillers was found in household waste POC L3 = 150 ml/planting hole, namely 13.05 tillers and the lowest was found in L0 = 0 ml/planting hole, namely 11.41 tillers.

The very real effect of applying duck manure organic compost is due to the fact that in shallot plants, element K is needed by growth and production because shallots are bulbous plants that really need potassium in large quantities so that can help the growth and production of shallot plants, the K element contained in duck manure organic compost is sufficiently available so that it can meet the needs of K elements in shallot plants (Utama, 2016).

There is a very significant effect on the number of tillers because the N, P and K content in duck manure organic compost is able to meet the nutrient requirements needed by shallot plants. The number of tillers is associated with a more effective uptake of light and carbon dioxide, so that the rate of photosynthesis increases. The results of photosynthesis will be carried to the vegetative parts of the plant, namely roots, stems, leaves and tubers which can affect plant growth and development (Rahman et al., 2016).

Dry Tuber Weight per Sample (g)

The results of statistical analysis of variance showed that the application of duck manure organic compost had a very significant effect on the weight of dry bulbs per sample (g) on shallot plants. Meanwhile, the application of POC for household waste and their interaction had no significant effect on dry production per sample of shallots (Allium ascalonicum L).

Table 2. Average Weight of Dried Tuber per Sample (g) on Duck Manure Organic Compost and POC Household Waste

Treatment	**Dry Tuber Weight per Sample (g)**
B = Duck Manure Organic Compost	
B0 = 0 g/planting hole	25.31dD
B1 = 50 g/planting hole	29.53 cC
B2 = 100 g/planting hole	31.09 bB
B3 = 150 g/planting hole	33.91 aA
L = POC Household Waste	
L0 = 0 ml/planting hole	29.22 aA
L1 = 50 ml/planting hole	29.38 aA

L2 = 100 ml/planting hole	30.31 aA
L3 = 150 ml/planting hole	30.94 aA

Note : Numbers followed by letters that are not the same show highly significant differences according to the Multiple Range Test (Duncan) at the 5% level (lowercase letters)

Table 2 shows the largest dry tuber weight per sample (g) in administrationduck manure organic compost B3 = (150 g/planting hole)that is 33.91 gand the smallest on treatmentB0 = 0 g/planting hole, which is 25.31 g. The largest dry tuber weight per sample (g) was found in the POC of household wasteL3 = 150 ml/planting hole which is 30.94 g and the lowest is found at L0 = 0 ml/planting hole which is 29.22 g.

The results of the analysis and statistical tests showed that the application of duck manure compost on the weight of dry tubers per sample showed very real data, the highest data were found in the B3 treatment (150 g/planting hole). This is in accordance with the statement (Baehaki et al, 2019), the increase in dry weight in each treatment is in accordance with the amount of compost given, this shows the amount of nutrients available to plants.

The dry tuber weight per sample showed no significant results, this was because the POC of household waste had not been able to increase the fruit weight of shallot plants. According to (Sutedjo, 2010) states that plant weight reflects the nutrient composition and plant tissue by including the water. More than 70% of the total plant weight is water. An increase in water content in the plant body causes activities in plant cells to run perfectly so that plant growth increases.

Dry Tuber Weight per Plot (g)

The results of statistical analysis of variance showed that the application of duck manure organic compost had a very significant effect on dry weight per plot (g) of shallot plants, while the application of POC for household waste and the interaction of the two had no significant effect on dry production per plot of shallots.

Table 3. Average dry production per plot (g) for application of organic compost duck manure and household waste POC.

Treatment	Dry Production per Plot (g)
B = Duck Manure Organic Compost	
B0 = control (without treatment)	268.75 d
B1 = 50 g/planting hole	371.25c
B2 = 100 g/planting hole	413.75b
B3 = 150 g/planting hole	543.75 a
L = POC Household Waste	
L0 = control (without treatment)	390.00 a
L1 = 50 ml/planting hole	397.50 a
L2 = 100 ml/planting hole	402.50 a
L3 = 150 ml/planting hole	407.50 a

In Table 3 it can be seen that the largest dry tuber weight per plot (g) is in the administrationduck manure organic compost B3 = (150 g/planting hole)namely 543.75 g and the smallest in the treatmentB0 = 0 g/planting hole, which is 268.75 g.

The largest dry tuber weight per plot (g) was found in household waste POCL = 150 ml/planting hole, which is 407.50g and the lowest is found at L1 = 50 ml/planting hole, which

is 390.00g.

The results of statistical analysis and testing showed that the application of duck manure compost in dry production per plot showed very real data and the highest data was found in the B3 treatment (150 g/planting hole). This is in line with the statement (Entaunayah et al, 2015) plant dry weight is an indicator of plant growth. High plant dry weight values indicate an increase in the process of photosynthesis because the nutrients needed are sufficiently available. This is related to photosynthate results which are translocated to all plant organs.

CONCLUSION

The results showed that the application of duck manure organic compost had a very significant effect on the parameters of the number of tillers (saplings), dry production per sample (g) and dry production per plot (g). Where is the best treatment onB3 = (150 g/planting hole). PPOC distribution of household waste and their interactions had no significant effect on the parameters of the number of tillers (saplings), dry production per sample (g) and dry production per plot (g).

Suggestion

It is recommended for research on radish plants in Telaga Jernih Village, Langkat Regency to use duck manure compost at a dose of 150 g/planting hole.

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