A function of Bioslurry Organic for Solid Fertilizer

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Abstract. *Indonesia is an agricultural country in which people mostly work as farmers and produce abundant farming outcomes. On one hand, the use of chemical fertilizer supports the plants growing well. On the other hand, it decreases the soil fertility and farming product quality. The alternative way to reduce or substitute the chemical fertilizer is by using organic fertilizer which can be made through composting method for 2 months mixing the leaf waste and rice straw. Before mixing both materials, the values of C, N, P, K and the water content of Bioslurry were respectively 15.17%, 0.27%, 0.3%, 0.05%, and 67.07%. Meanwhile, the values of C, N, P, K and the water content of leaf waste were consecutively 41.12%; 1.22%; 1.16%; 8.94%; and 28.77%. Moreover, the values of C, N, P, K, and the water content of rice straw were sequentially 39.42%; 1.20%; 1.05%; 10.07%; and 31.23%. After mixing both materials through composting method, the results of rice straw fertilizer got C-Organic 20.87%; N 2.01%; P 0.16%; K 5.64%; water 22.31%, and C/N ratio 16.38%. Meanwhile, the composting process of leaf waste yielded C-Organic 25.44%; N 1.18%; P 0.18%; K 7.95%; water 11.85%, and C/N ratio 21.55%.*

Keywords: *PDAM Performance, Dynamic Models, Minimum Service Standards, PLE plus Venses*

1. Preliminary

Indonesia is an agrarian country where most of the population earns a living as farmers with abundant agricultural produce [1-3]. Abundant agricultural products are supported by the presence of fertilizer as a support for the growth of fertile agricultural plants [4-7]. However, some farmers in Indonesia still use chemical fertilizers to increase their yields, but it will cause soil fertility to decrease and lead to a decrease in the quality of agricultural products [8-10] as well as the pollutant of water [11]. In addition, the use of any other material that use will also increase the possibility of the contamination [12-13]. An alternative to reduce or replace the use of chemical fertilizers is to use organic fertilizers [14-15].

Galengdowo is a village located in Wonosalam District, Jombang Regency, East Java. Galengdowo Village consists of 5 hamlets namely Wates, Singgar, Plumpung, Galengdowo and Panguruan [16-22]. The majority of Galengdowo villagers make a living as farmers and dairy farmers. From processing dairy cow dung into biogas also produces biogas waste in the form of Bio-slurry which produces 1 ton of cow dung every day. The absence of further utilization of the Bio-slurry produced is the reason for the research conducted at Galengdowo Hamlet.

2. Research Method

2.1. Materials and Variation

Materials used in the study included solid Bioslurry, and mixed materials using rice straw and leaf litter with 10 treatments and variations in composition. Treatment 1 = Bioslurry: leaf litter (4kg: 16kg), Treatment 2 = Bioslurry: leaf litter (8kg: 12kg), Treatment 3 = Bioslurry: leaf litter (10kg: 10kg), Treatment 4 = Bioslurry: leaf litter (12kg: 8kg), Treatment 5 = Bioslurry: leaf litter (16kg: 4kg), Treatment 6 = Bioslurry: rice straw (4kg: 16kg), Treatment 5 = Bioslurry: leaf litter (16kg: 4kg), Treatment 6 = Bioslurry: rice straw (4kg: 16kg)), Treatment 7 = Bioslurry: rice straw (8kg: 12kg), treatment 8 = Bioslurry: rice straw (10kg: 10kg), treatment 9 = Bioslurry: rice straw (12kg: 8kg), treatment 10 = Bioslurry: rice straw (16kg : 4kg).

2.2. Variable Identification

The test parameters analyzed are C, N, P, K and water content. The location of the study was conducted at the ITATS Environmental Quality Laboratory. The study was conducted by aerobic composting methods and analysis was carried out at the ITATS Environmental Quality Laboratory and Baristand Indonesia.

3. Result and Discussion

Good quality organic solid fertilizer that has a value in accordance with the Regulation of the Minister of Agriculture No. 216 of 2019 for the parameters C, N, P, K, C / N ratio. The parameters C, N, P, K, and C / N ratio according to the quality standard is minimum 15%, minimum 2%, minimum 2%, minimum 2%, and less than 25. Figure 4.10 shows the recapitulation image for each parameter contained in organic solid fertilizer in accordance with Permentan Number 216 Year 2019. From the results of research with 10 treatments obtained the best results on the 8kg Leaf Fertilizer with the results obtained are the value of C, N, P, K, C / N ratio, and water content and pH of 11.85%, 1.18%, 0, 18%, 7.96%, 21.55%, 11.85%, 7. In the 12 kg rice straw fertilizer the best results were obtained with a C, N, P, K, C / N ratio, and water content and pH of 20 , 87%, 2.01%, 0.16%, 5.64%, 10.38%, 10.38%, 22.31%, 7. The results of the study can be seen in Table 1.

Table 1. Parimeter of study

No	Kode /Variasi Komposisi	Parameter											
		Kadar Air		C-Organik		N		P		K		C/N Rasio	
		Baku Mutu	Hasil	Baku Mutu	Hasil	Baku Mutu	Hasil	Baku Mutu	Hasil	Baku Mutu	Hasil	Baku Mutu	Hasil
1	PJ 4kg	8 sampai 12	16,41	Minimal 15	17,15	Minimal 2	0,33	Minimal 2	0,14	Minimal 2	11,61	Kurang dari 25	51,96
2	PJ 8kg		24,17		17,44		0,47		0,14		3.78		37,1
3	PJ 10kg		25,35		18,42		1,52		0,14		4,06		12,11
4	PJ 12kg		22,31		20,87		2,01		0,16		5,64		10,38
5	PJ 16kg		36,69		20,85		0,73		0,11		2,81		28,56
6	PD 4kg		10,77		25,65		0,77		0,19		7,69		33,31
7	PD 8kg		11,85		25,44		1,18		0,18		7,96		21,55
8	PD 10kg		28,67		19,51		2,13		0,18		1,98		9,15
9	PD 12 kg		23,13		17,71		1,52		0,17		3,88		11,65
10	PD 16kg		26,52		20,48		0,44		0,17		5,06		46,54

The best composition is in accordance with Regulation No. 216 of 2019

That meets the quality standards of organic solid fertilizers (permentan number 216 in 2019)

The highest value but did not meet the permentan standard number 216 in 2019.

Nitrogen is the most important nutrient in plant growth such as leaves, stems, and roots in plants, nitrogen serves to stimulate plant growth and has an important role in the formation of leaf green matter and also in the formation of organic compounds (Lingga and Marso, 2013). From the results of the study with 10 treatments obtained the best results on the 8kg Leaf Fertilizer with the results obtained that the

N value of 1.18% and 2.01% in hay fertilizer. Phosphorus in plants has the function to stimulate the growth of roots, seeds and young plants and also functions as an ingredient in the formation of proteins and helps the process of breathing and accelerates the removal and cooking of seeds (Lingga and Marsono). From the results of the study with 10 treatments obtained the best results on the 8kg Leaf Fertilizer with the results obtained are the P value of 0.18% and 0.16% in hay fertilizer. The results of potassium analysis obtained the best results on leaf fertilizers at 7.96% and on straw fertilizers at 5.64%. The results of analysis on the C content obtained results in leaf fertilizer by 11.85% and in straw fertilizer by 20.87%. The results of the analysis of the content of water content obtained in leaf fertilizer amounted to 21.55% and 10.38% in straw fertilizer.

4. Conclusion

a. The results of the best solid fertilizer characteristic test on 8 kg Leaf Fertilizer with Bioslurry composition variation: Mixed Material (40%: 60%) with the results of C-organic, N, P, K, and moisture content of 25.44%, 1.18%, 0.18%, 7.96% and 11.85%.
b. The results of the best solid fertilizer characteristic test on 12kg Straw Fertilizer with the results of C-Organic, N, P, K, and water content of 20.87%; 2.01%; 0.16%; 5.64%; 22.31%. Compared to Permentan Number 216 Year 2019 About About Organic Fertilizer, it can be said that it meets the standards of solid fertilizer, but the phosphorus content does not meet the quality standards of organic solid fertilizer.

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