EVALUATION OF QUALITY ORGANIC FERTILIZER AT VERMICOMPOSTING THE CATTLE FAECES AND BAGASSE.

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Abstract

This research aim to know the quality of organic fertilizer (content of N, P and K) from various density levels of *Lumbricus rubellus* at vermicomposting the cattle faeces and bagasse. . This research used a Completely Randomized Design (RAL) with three treatment (P1= 1.5 kg/m^2, P2 = 2 kg/m^2, P3 = 2.5 kg/m^2) with six replication. The result indicated that the density of *Lumbricus rubellus* have an effect on reality improve rate of P and of K, but having an effect on is not real improve rate of N. The highest average value of N, P and K yielded by P3 (2.5 kg/m^2) with 3.22% N, 0.92% P, and 0.25 % K.

Keyword : density level of *Lumbricus rubellus*, vermicomposting, cattle faeces, bagasse, content of N, P and K.

INTRODUCTION

Conservancy of the beef cattle yield especial product in the form of meat, and yield by product in the form of faeses. In gross, feses will be generating potency to contaminate the environment, therefore that required to done the process. Vermicomposting is one of the ways of processing the cattle faeces.

Vermicomposting represent process of organic waste degradation become humus constructively by earth-worm organism. Earth-Worm type which is often used for vermicomposting is *Lumbricus rubellus*. Vermicomposting process needed by the ideal balance of C/ N, so that process can continue better. The beef cattle faeces have low balance of C/N, to reach the ideal balance of C/N require to be enhanced by a materials which having high balance of C/N, the materials such as bagasse. Other factor which influences the vermicomposting process is the density level of *Lumbricus rubellus* at compost.

Vermicomposting process produce organic fertilizer which content of N, P and K. Content of N, P and K represent indicator quality of fertilizer. Therefore the research was done to know the quality of organic fertilizer (content of N, P and of K) from the various density levels of *Lumbricus rubellus* at vermicomposting the cattle faeces and bagasse to.

MATERIALS AND METHOD

The material was used such as beef cattle faeces, bagasse, *Lumbricus rubellus*, and a set chemical matter for the analysis the content of N, P and K.

The appliance was used such as plastic basin fairish of 27.5 cm X 21.5 cm X 12.5 cm, ratch plastic fairish of 27.5 cm X 21.5 cm, and a set laboratory appliance for the analysis element of N, P and K.

Research method was used is experiment method with Complete Random Device (RAL), with three treatment (P1= 1.5 kg/m^2, P2 = 2 kg/m^2, P3 = 2.5 kg/m^2) with six replication. This research done to know element rate of N, P and of K at the organic fertilizer.

RESULT AND DICCUSION

Influence of Various Treatments to the Element Rate of N at Organic Fertilizer.

The average rate of N at organic fertilizer presented in Tables 1. Result of research indicate that the average rate of N at P1 (3.01%), P2 (3.11%) and P3 (3.22%). After done the ANOVA analyze (Tables 2), the result was obtained of that each treatment give do not differ reality influence. This matter means the treatment of various density levels of *Lumbricus rubellus* do not give real influence to rate of N organic fertilizer which produced.

This matter is anticipated by the amount of worm population of *Lumbricus rubellus* do not influence the vermicomposting, so that obtained by rate of N in organic fertilizer which does not differ, the part of earth-worm in vermicomposting is to quicken the decomposition of organic materials. This matter is supported by opinion of CSIRO (1979), who expressing that earth-worm eat organic materials and very effective in reducing organic materials particle size become form like ground and quicken the composting process. Saifuddin Sarief (1986) expressing that element of N obtained by mineralization process, that process crushing of organic materials which come from plant or animal become inorganic compound (simple mineral). While Foth (1995) expressing that element of N readily permeated by crop is element of N with form of inorganic N. If the not exploited, the Inorganic N reconverted to become organic N by nitrification process. Mineralization process influenced by the rate of N in organic materials. The rate excelsior of N inorganic materials also make excelsior rate of N inorganic which produced by mineralization process.

Tables 1. Influence Of the Treatment To Rate of N the Organic Fertilizer.

Replication	Rate of N		
	P1	P2	P3
	..... %		
1	3.22	2.90	3.05
2	3.01	3.14	3.57
3	2.93	2.93	3.22
4	3.13	3.13	3.13
5	2.85	3.31	3.19
6	2.91	3.22	3.16
Mean	3.01	3.11	3.22

Tables 2. ANOVA Analyze to Rate of N the Organic Fertilizer.

	Degree of freedom	Sum of Square	Mean Square	Value of F	F table
Between Treatment	2	0.135	0.067	2.577ns	3.68
Within treatment	15	0.394	0.026		
Total	17	0.529			

*ns means not significant

Influence Various Treatments to the Element Rate of P at Organic Fertilizer

The average element rate of P at organic fertilizer presented in Tables 3. Result of research indicates that average rate of P at P1 (0.048%). P2 (0.087%) and P3 (0.192%). After to ANOVA analyze. the result was obtained of that in each treatment give different reality influence . To know difference every treatment done by test of Tukey (Tables 4).

Table 3. . Influence Of the Treatment to Rate of P the Organic Fertilizer

Replication	Rate of P		
	P1	P2	P3
	.....	%.....	
1	0.05	0.09	0.19
2	0.05	0.10	0.20
3	0.05	0.10	0.18
4	0.04	0.05	0.16
5	0.05	0.08	0.21
6	0.05	0.10	0.21
Mean	0.048	0.087	0.192

Table 4. The Result of test of Tukey to Rate of P the Organic Fertilizer

($\alpha = 0.05$)

Treatment	Average rate of P (%)	Signification
P1	0.048	a
P2	0.087	b
P3	0.192	c

The result of test of Tukey indicate that influence of treatment of P1 (1.5 kg/m^2) differing reality with P2 (2 kg/m^2) and P3 (2.5 kg/ m^2). The influence of treatment of P2 (2 kg/m^2) differing reality with treatment of P3 (2.5 kg/m^2). This matter means the increase the worm population will

make the increase the element rate of P which implied in organic fertilizer. As does at element of N. element of P produced through mineralization process done by microorganism. But do not likes element of N easy be volatile. element of P is not volatile so that its availability tend to remain. This matter was strengthened by Foth (1995). that there was no or a little phosphoric acid missing of livestock waste pass by volatilization process. The part of worm in course of forming of P element is to make the fiber degradation become more simple in casting (worm dirt) which can used by microorganism to form element P. The increase of the worm population in compost will make the increase of casting product which has organic materials to be used to mineralization element of P process. This matter as according to opinion of Gaddie and of Douglas (1977) expressing that organic materials which eaten by earth-worm will be to demolish in its digestion so that become refinement. And after 24 hour digested the rest materials will to be released as casting through anal to the land surface.

Influence Of Various Treatments to Rate of K the Organic Fertilizer

The average rate of K at organic fertilizer showed in Tables 5. The Result indicates that average rate of K at P1 (0.063%). P2 (0.113%) and P3 (0.253%). After ANOVA analyze. the result was obtained that each treatment give different influence of reality. Test of Tukey used to know the difference every treatment (Tables 6).

Table 5. Influence Of the Treatment to Rate of K the Organic Fertilizer

Replication	Rate of K		
	P1	P2	P3
	.....	%	.....
1	0.07	0.12	0.25
2	0.07	0.13	0.27
3	0.06	0.12	0.24
4	0.05	0.07	0.21
5	0.07	0.11	0.28
6	0.06	0.13	0.27
Mean	0.063	0.113	0.253

Table 6. The Result test of Tukey to Rate of K the Organic Fertilizer

($\alpha = 0.05$

Treatment	Average rate of P (%)	Signification		
P1	0.063	a		
P2	0.113		b	
P3	0.253			c

The Result of test of Tukey indicate that influence of treatment of P1 (1.5 kg/m^2) differing reality with P2 (2 kg/m^2) and P3 (2.5 kg/m^2). Influence of treatment of P2 (2 kg/m^2) differing reality with treatment of P3 (2.5 kg/m^2).

As does at element of N and of P, element of K produced by mineralization process which done by microorganism. The part of worm in course of forming element of K is to make the fiber degradation become simpler in casting (worm dirt) which can used by microorganism to form element of K. The increase of the worm population in compost will make the increase of casting product which has organic materials to be used to mineralization element of K process This matter as according to opinion of Musnamar (2003) expressing that element of K yielded degradation activity of organic materials by microorganism.

CONCLUSION AND SUGGESTION

Conclusion

1. The various density levels of *Lumbricus rubellus* at vermicomposting do not give real influence on the increase of the rate of N. but have an effect on reality improve rate of P and K organic fertilizer which produced
2. The highest average element value of N. P and K was obtained at P3 with density level of 2.5kg/m^2 (N 3.22%, P 0.192%, and K 0.253%).

Suggestion

To get organic fertilizer with highest value of N. P and of K can be used by the density level of worm of *Lumbricus rubellus* with population 2.5 kg/m^2 at vermicomposting of cattle faeces and bagasse.

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