THE EFFECT OF USE DIFFERENT LEVEL BUFFALOS FERMENTED COMPOST ON THE PRODUCTIVITY AND QUALITY OF GRASS (PASPALUM CONJUGATUM, BRACHIARIA DECUMBENS, DIGITARIA MILANJIANA)

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Abstract. There seach objective was to determine the productivity and nutrient content of Paspalumconjugatum, Brachiariadecumbens, Digitariamilanjiana by buffalo fermented compost. The research was conducted at the Goat Farm Research Station SeiPutih, SubdistrictGalang, LubukPakam, North Sumatra from October 2015 through February 2016. The design used was split plot design (plots divided) with mainplotwas kind of grass A1 (Paspalumconjugatum), A2 (Brachiariadecumbens), A3 (Digitariamilanjiana) and the subplot was fertilizer dose as the level (0, 10, 20 and 30 t/ha/y). The parameters studied were production of fresh, high plant, number of tillers, dry matter, crude protein, and crude fiber.
The results showed that administration of buffalo fermented compost better than without the use of fertilizers. Dosing compost significant affect ($P<0.05$) in increasing production of fresh, high plant, number of tillers, dry matter, crude protein and crude fiber. The conclusion of this study that the best dose was 30 t/ha/y of buffalo fermented compost and the best interactions was dose of 30 ton/ha/year on Digitariamilanjiana.
Keywords: Paspalumconjugatum, Brachiariadecumbens, Digitariamilanjiana, buffalo fermented compost, dose, kind of grass

1. Introduction

The recycling of livestock waste plays a role in preventing environmental pollution, while simultaneously increasing crop production. It is quite obvious that a considerable amount of livestock waste can be converted into low-cost organic fertilizer. Livestock manure has high value of fertilizer (solid and liquid) and easy to decompose. The common traditional way to increase soil organic matter content is to add immature materials in the form of manure, compost or plant material such as green manure.

The use of manure as a source of plant nutrients is an agricultural practice that has long been implemented by farmers in the tropical region of Asia, especially in paddy fields. The use of manure has long been identified with the success of fertilizer programs and sustainable agriculture. This is not only because it is able to supply organic materials, but because it is associated with feed plants, which in general improve the protection and conservation of the soil.

Economic conditions are quite heavy for farmers on the one hand and the effort to maintain and improve soil fertility on the other. requires farmers to reconsider all local forms of organic enhancers, such as manure, crop residues and green manure.

Before use of manure on agricultural land, it is necessary to study deep enough about farmers' habit toward the manure they have, because the technical and social problems of farmers often hinder the program that has been prepared, both for short and long term. The results showed that the effect of manure is related to nutrient composition contained. The choice between manure and inorganic fertilizers is simply due to consideration of nutrient content, economical, transportation and accessibility.

Effective fertilization can be seen from the number of doses of fertilizer given and nutrients contained in the fertilizer. Fertilization can be done in the form of organic or inorganic fertilizers. Manure is one form of organic fertilizer that can be used to improve soil fertility. As organic matter in the soil, kamdang fertilizers in addition to the role of nutrients, although in small quantities, also improve the soil physical and chemical properties of the soil.

The use of buffalo feces as an organic fertilizer should be through a fermentation process that is the process of changing complex compounds into simpler compounds, because the fermentation process can increase the chemical content such as nitrogen, phosphate, potassium and water, reducing the smell of stinging fungus and produce solid fertilizer not hot so good applied to the plant.

Fresh water buffalo in fermentation process requires bacteria decomposers and also energy source for bacteria decomposers. Expected with a touch of technological innovation and the addition of the right mixed material, fecal waste is processed (fermented) as a way of optimization to produce solid fertilizer with high quality and nutrient content as plant nutrients especially on productivity and nutrient content (SK, PK, EB) (Paspalumconjugatum, Brachiariadecumbens, and Digitariamilanjiana) thus making one income for every breeder.

2. Materials and Methods

The research conducted in the field of forage feed of LokaGoiSeiPutih Goat Research Unit, Galang from June to September 2015.Fermented buffalo feces given to the ground as a source of carbon and nitrogen energy for decomposers, MOL as starter decomposers during fermentation, grass (Paspalumconjugatum, Brachiariadecumbens, and Digitariamilanjiana) in the form of pols shoot as the object to be studied.Equipment used include: hoe, meter, gembor, paper label, knife, scales as tool of weighing fresh material and dry material, sack as tool where cut grass, oven as tool of drying of fresh material after harvest to get dry material.

The research design was divided into split plot design with 2 treatment factors and 3 replications. The first factor (main plot) was:A1 = Paspalumconjugatum, A2 = Brachiariadecumbens, A3 = Digitariamilanjiana. The second factor (sub plot) was:P0 = fermented buffalo dung 0 kg, P1 = fermented buffalo 1 kg (10 t / ha), P2 = fermented buffalo dung 2 kg (20 t / ha), P3 = fermented buffalo dung 3 kg (30 t / ha). Parameters were as follows :1. Number of Plant Tillers, 2. Plant Height, 3. Fresh Grass Production, 4. Dried Material Production, 5. Nutritional content Crude protein (CP), Crude fiber (CF) and gross energy (GE)

3. Results and Discussion

3.1. Plant Height ofPaspalumconjugatum, Brachiariadecumbens, Digitariamilanjiana

The result of this research showed that application of fertilizer gives a real effect to the growth of plant height. Further test results with DMRT (Duncan Multiple Range Test) on measurements of plant height of Paspalumconjugatum, Brachiariadecumbens, Digitariamilanjiana during the study can be seen in Table 1 below:

Table 1. The growth of plant height.:Paspalumconjugatum, Brachiariadecumbens, Digitariamilanjiana

Grass type (*Main Plot*)	Fertilizer Dose (*Sub Plot*)				Mean
	P0 (control)	P1 (10 ton/ha)	P2 (20 ton/ha)	P3 (30 ton/ha)	
A1	50,00	59,00	63,67	69,33	$60,50^{B}$±8,17
A2	43,00	48,67	56,00	68,33	$54,00^{B}$±10,93
A3	79,00	86,67	104,00	124,67	$98,58^{A}$±20,29
Mean	$57,33^{D}$	$64,78^{C}$	$74,56^{B}$	$87,44^{A}$	

Different superscripts on the same line showed a significant difference in the Duncan Test (P <0.05)

The highest plant height was obtained at A3P3 treatment and followed by each treatment of A3P2, A3P1 and A3P0. While the lowest plant height was obtained at A2P0 treatment and followed by each treatment of A2P1, A1P0 and A2P2.The difference of plant height of Paspalumconjugatum, Brachiariadecumbens, Digitariamilanjiana due to fertilizer (P1, P2 and P3) naturally will exhibit better growth when compared to plants without fertilizer (P0). This is in accordance with the statement of Madjidet. al., [1] which states that fertilizer is a material that is organic or inorganic when added to soil or cultivation can improve the physical, chemical, biological properties of the soil and can increase plant growth.

3.2. Fresh Production of Paspalumconjugatum, Brachiariadecumbens, Digitariamilanjiana

The results showed that fertilizer giving a significant effect on fresh production of *Paspalumconjugatum, Brachiariadecumbens, Digitariamilanjiana*. Further test results with DMRT (Duncan Multiple Range Test) during the study can be seen in Table 2 below:

Table 2.Fresh production of*Paspalumconjugatum, Brachiariadecumbens, Digitariamilanjiana*

Grass Type (*Main Plot*)	Fertilizer Dose (*Sub Plot*)				Mean
	P0 (control)	P1 (10 ton/ha)	P2 (20 ton/ha)	P3 (30 ton/ha)	
A1	3858,14	4122,35	4276,45	4567,45	$4206,03^{B}$±296,41
A2	4183,57	4599,17	5178,96	5552,80	$4878,62^{B}$±607,15
A3	7227,92	7767,71	8132,31	8487,76	$7903,92^{A}$±538,07
Mean	$5089,90^{D}$	$5496,40^{C}$	$5864,70^{B}$	$6202,70^{A}$	

Different superscripts on the same line showed a significant difference in the Duncan Test (P <0.05)

According to the results of variance analysis showed that the application of fertilizers with different doses on the grass species *Paspalumconjugatum, Brachiariadecumbens, Digitariamilanjiana* gave different results significantly to fresh production. In this study it was obtained that interaction of A3P3 produces fresh production as much as 8487,76 gram significantly higher than the other treatment. Viewed from the results of research, fresh production has increased along with the increasing of fertilizer dosage. This is due to the production of grasses affected by nutrients contained in the soil as food reserves for plants, so that on the ground that does not have enough nutrients can not provide food reserves for plants that affect the level of production. Therefore fertilization by using organic fertilizer can affect the quality of soil and thus, increase grass production and accelerate vegetative growth of plants and eventually accelerate the production of fresh forage.

3.3. Number of tillers ofPaspalumconjugatum, Brachiariadecumbens, Digitariamilanjiana

The results showed that fertilizer application significantly influenced the number of tillers of *Paspalumconjugatum, Brachiariadecumbens, Digitariamilanjiana*. Further test results with DMRT (Duncan Multiple Range Test) on the number of tillers during the study can be seen in Table 3 below:

Table 3. Number of tillers of*Paspalumconjugatum, Brachiariadecumbens, Digitariamilanjiana*

Grass Type (*Main Plot*)	Fertilizer Dose (*Sub Plot*)				Mean
	P0 (control)	P1 (10 ton/ha)	P2 (20 ton/ha)	P3 (30 ton/ha)	
A1	4,33	7,00	9,33	12,00	$8,16^{B}$±3,27
A2	5,67	8,67	12,67	15,33	$10,58^{B}$±4,26
A3	8,67	14,00	19,67	23,33	$16,41^{A}$±6,43
Mean	$6,22^{D}$	$9,89^{C}$	$13,89^{B}$	$16,89^{A}$	

Different superscripts on the same line showed a significant difference in the Duncan Test (P <0.05)

The statistical results show that different fertilizer giving different result on the number of tillers Paspalumconjugatum, Brachiariadecumbens, Digitariamilanjiana. The highest number of tillers was obtained at interaction of A3P3 and followed by each treatment of A3P2, A2P3 and A3P1. Treatment (P0) resulted in significantly lower number of tillers compared with treatment (P1, P2 and P3) with different treatment of fertilizer doses. This is because Treatment P0 is control (without fertilizer application) thus affecting the growing number of tillers compared with fertilizer treatment, since no nutrients in the soil provide carbohydrates for the growth of new tillers. Soil that has sufficient nutrient value will produce good production value also to each plants or can suppress the growth of plant shoots. One type of fertilizer is good enough, so that the physical properties of the soil can be maintained is organic fertilizer (can use compost or manure). This fertilizer can be formed from the leaves, straw or animal dung that has been decayed/destroyed and turned into parts of the soil Andadari et al., [2].

3.4. Production of Dried Matter of Paspalumconjugatum, Brachiariadecumbens, Digitariamilanjiana

The result of this research showed that the dosage of fertilizer on each species of grass to the production of dried material from*Paspalumconjugatum, Brachiariadecumbens, Digitariamilanjiana* with DMRT (Duncan Multiple Range Test) test result can be seen in Table 4 below.

Statistical data analysis showed that the application of fermented buffalo fertilizer with different doses on Paspalumconjugatum grass species, Brachiariadecumbens, Digitariamilanjiana gave very different result on dried material production. The interaction of A3P3 treatment resulted in the production of dried material as much as 90.64 grams significantly higher than the other treatments. This is due to the increasing number of compost fertilizers in the soil will activate microorganisms that play a role in improving soil nutrient content. Organic materials also directly affect the physiology of plants such as increasing respiration activities to increase plant growth, and increased leaf breadth will increase production and dried materialcontent. Manure can retain soil organic matter, increase soil biological activity and also increase groundwater availability. The higher the soil moisture content the absorption and transport of nutrients and water will be better, so the rate of photosynthesis to produce food reserves for plant growth is more secure and automatic production will increase Ifradi et al., [3] He also stated that the application of manure will increase the production of dried matter, crude protein and lower crude fiber.

Table 4. Production of dried matter :*Paspalumconjugatum, Brachiariadecumbens, Digitariamilanjiana*(g)

Grass Type (*Main Plot*)	Fertilizer (*Sub Plot*)				Mean
	P0 (control)	P1 (10 ton/ha)	P2 (20 ton/ha)	P3 (30 ton/ha)	
A1	88,48	88,52	88,54	88,55	$88,52^{B}$±0,03
A2	87,53	87,58	87,63	87,71	$87,61^{C}$±0,07
A3	90,43	90,52	90,57	90,64	$90,54^{A}$±0,08
Mean	$88,81^{C}$	$88,87^{C}$	$88,91^{B}$	$88,96^{A}$	

Different superscripts on the same line showed a significant difference in the Duncan Test (P <0.05)

3.5. Crude Protein Content of*Paspalumconjugatum, Brachiariadecumbens, Digitariamilanjiana*

The results of variance analysis showed that different doses of fertilizer on *Paspalumconjugatum, Brachiariadecumbens, Digitariamilanjiana* gave significantly different results on crude protein content. In this study it was found that crude protein in grass was highest in A3P3 treatment with 30 ton/ha/yeardose of manure followed by A3P2, A3P1 and A3P0 treatment. This can be presumed because the source of nitrogen availability can be met. In other words the protein content increases with the presence of nitrogen content.

Crude protein content followed by DMRT (Duncan Multiple Range Test) can be seen in Table 5 below.

Table 5.Crude protein content of*Paspalumconjugatum, Brachiariadecumbens, Digitariamilanjiana*(%)

Grass Type (*Main Plot*)	Fertilizer (*Sub Plot*)				Mean
	P0 (kontrol)	P1 (10 ton/ha)	P2 (20 ton/ha)	P3 (30 ton/ha)	
A1	9,08	9,23	9,37	9,47	$9,28^{C}$±0,16
A2	9,52	9,58	9,62	9,71	$9,60^{B}$±0,07
A3	11,23	11,49	11,69	11,78	$11,54^{A}$±0,24
Mean	$9,94^{D}$	$10,10^{C}$	$10,23^{B}$	$10,32^{A}$	

Different superscripts on the same line showed a significant difference in the Duncan Test (P <0.05)

3.6. Crude Fiber Content of*Paspalumconjugatum, Brachiariadecumbens, Digitariamilanjiana*

The results showed that fertilizer giving a significant effect on crude fiber content of *Paspalumconjugatum, Brachiariadecumbens, Digitariamilanjiana*. Further test results with DMRT (Duncan Multiple Range Test) on crude fiber content during the study can be seen in Table 6 below:

The statistical results showed that different fertilizer dose on Paspalumconjugatum, Brachiariadecumbens, Digitariamilanjiana gave significantly different results on crude fiber content. Grass A3 produces the highest mean crude fiber and shows no interaction at each treatment. In the picture also obtained treatment P1, P2 and P3 significantly higher than treatment P0 ie without the provision of fertilizer fermentation. The highest crude fiber content is the interaction of A3P0 treatment of 32.80%. This is because P0 is not given fertilizer treatment resulting in low protein and high coarse fiber yield compared to P1, P2 and P3 given fertilizer treatment resulting in high protein and low crude fiber compared with P0. This is in accordance with the statement of Setyorini et al., [4] the role of manure in suppressing the crude fiber content is very real. Where manure contains N, P, K and S that affect the content of crude fiber forage.Effect of N in improving the comparison of protoplasm to thin cell wall materials. This condition causes the leaves to contain more water and less hard, on the contrary the low nitrogen content can result in the thickness of leaf cell walls with small cell size, thus the leaves will become hard and full of fiber-fiber.

Table 6. Crude fiber content of *Paspalumconjugatum, Brachiariadecumbens, Digitariamilanjiana*(%)

Grass Type (*Main Plot*)	Fertilizer (*Sub* Dosage *Plot*)				Mean
	P0 (control)	P1 (10 ton/ha)	P2 (20 ton/ha)	P3 (30 ton/ha)	
A1	30,42	30,35	30,23	30,16	$30,29^{B}$±0,11
A2	28,48	28,40	28,28	28,21	$28,34^{C}$±0,12
A3	32,80	32,76	32,69	32,61	$32,71^{A}$±0,08
Mean	$30,56^{A}$	$30,50^{B}$	$30,40^{C}$	$30,33^{D}$	

Different superscripts on the same line showed a significant difference in the Duncan Test (P <0.05)

4. Conclusions and Recommendation

4.1. Conclusions

The effect of the use of various levels of fermented buffalo feces has a significant effect on the production of Paspalumconjugatum, Brachiariadecumbens, Digitariamilanjian where the highest production is found in fermented buffalo faeces at dose 30 ton/ha/year. In this study also obtained the results that the nutritional content of Paspalumconjugatum, Brachiariadecumbens, Digitariamilanjiana is best at a dose of 30 ton/ha/yearcompared with other doses.

4.2. Recommendation

To increase the production and obtain the best nutrition forage of fodder, we can use organic fertilizer in the form of fermented buffalo feces with the recommended dose is 30 ton/ha/year.

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