

# Influence of Liquid Organic Fertilizer on The Production and Carrying Capacity of Livestock from Setaria Grass (*Setaria splendida*)

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**Abstract.** The traditional market, everyday produces organic waste that could potentially give rise to pollution and disruption of human life. One of utilization that can be developed is to turn it into a liquid organic fertilizer and used in the cultivation of feed. *Setaria splendida* is a plant feed the forage can be given for all types of livestock. The research was done to get the best dosage of liquid organic fertilizer from traditional market waste. The treatment used is a mixture of liquid organic fertilizer for traditional market waste with water in comparison of 0:0, 1:1, 1:2 and 1:3. A Complete Random Design was used. Each treatment was repeated four times on a swath of size 1 x 1 square meters and data used the fourth defoliation age harvest every defoliation is 35 days. The parameters investigated is fresh forage production and carrying capacity for large and small cattle animals. The results showed the average production levels the range of 0.96375 kg – 1.083 kg per square meter, so it can be to maintain 13.38 – 15.04 head of cows or 53,52 – 60,16 head of goats per acre per year. The best treatment is a liquid organic fertilizer mixed with water comparison at 1:2.

Keywords: Organic liquid; fertilizer, waste; production; carrying capacity.

## Introduction

Traditional markets are widely held in urban areas, producing large amounts of organic waste. The waste has the potential to provide pollution and potential disruption to community activities [1]. Basically organic waste can be processed into a more useful material for human life [2]. Usually organic waste is made into compost to fertilize the soil and plant growth [3], but the effort is not only compost but can be processed to produce organic liquid fertilizer that can also be used for agricultural activities.

Livestock ruminants, in his life in dire need of forage from the plant feed. Forage quality is important in performance and productivity, while quality is influenced by management factors, one of which is fertilization [4]. The *Setaria* grass (*Setaria splendida*) has forage production and is of sufficient quality to support the development of ruminant farms. To maintain the level of production and quality, in cultivation, the action of fertilization on plant crops can be done with organic and inorganic materials [5]. Liquid organic fertilizer from traditional market organic waste is expected to give a real effect on the production of feed crops while addressing environmental problems. If it can be realized then the organic waste of abundant traditional market waste, will provide benefits in human life through the cultivation of feed crops on ruminant livestock business.

Certain production levels of feed crops can provide the carrying capacity and carrying capacity of livestock and human life. The use of liquid organic fertilizer from organic trashes of traditional markets on *setaria* (*Setaria splendida*) will provide a certain carrying capacity and capacity in livestock populations that are expected to increase livestock population maintained. In this regard, it is necessary to conduct research to get the right formula in the potential utilization of organic waste of traditional market waste which is processed into liquid organic fertilizer on the grass *setaria* and calculate its capacity in ruminants farm business. The benefits of research lead to the utilization of traditional market waste resources into material that is more supportive of human life.

## Research Methods

The act of fertilization on *Setaria* grass has been done through experimental research with organic liquid fertilizer material from traditional market waste. The design used was Completely Randomized Design with 4 (four) treatments repeated 4 (four) times. The treatments were 3 (three) concentrations of liquid organic fertilizer of traditional market waste and one control treatment that was in comparison between liquid organic fertilizer and water covering 1: 1, 1: 2, 1: 3 and 0: 0. Laboratory analysis of fertilizer organic liquid waste of traditional

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market has nanocyte level 0,038 percent, P2O5 as much as 81,748 mg / l and K2O 0,134 percent and C / N = 0,92. In the mixture of water more and more, the concentration of nutrient content of liquid organic fertilizers is getting less. The treatment plot is 1 x 1 meter in size. The observed parameters are fresh forage production which can then be used to calculate the carrying capacity and capacity of large and small livestock. Work procedures include land management, planting, fertilizing, and harvesting. Planting using torn pieces, each plot consists of 8 clumps, each clump contains 2 (two) plants. Fertilization is done at plant age 10 days after planting and harvesting. Harvesting is done at age 35 days. Furthermore, observations were made on the 2nd, 3rd and 4th def. The data used were the fourth defoliation data at harvest age each defoliation was 35 days. The use of the 4th defoliation data because at that stage of defoliation the growth of the plant has been relatively constant. The parameters studied were fresh forage production and calculation of capacity for large livestock and small livestock. For data analysis used Completely Randomized Design. If there are differences in test results, tested with Orthogonal Polynomial.

Table 1. Dosage of Organic Fertilizer of Processed Traditional Wastes Traditional Market

No	Treatment= Liquid Organic Fertilizer: Water	Per Hectare		
		Organic Fertilizer Liquid (liter)	Water (liter)	Amount (liter)
1	D1 = 1:1	1.500	1.500	3.000
2	D2 = 1:2	1.000	2.000	3.000
3	D3 = 1:3	750	2.250	3.000
4	D0 = 0:0	0	0	0

## Result and Discussion

### a. Condition of Research Sites

The research took place at Experimental Sub-Station of Faculty of Animal Husbandry, Unsoed Purwokerto at coordinates 7056 ' - 7058' South Latitude (LS) and 109023 ' - 109045' East Longitude (BT). Soil analysis showed soil texture and structure on texture class with sand fraction 29,43% dust 10,01% and clay 60,56%, soil pH 6,02. Condition of soil quality above, according to [6] 4) showed that they were able to give good growth to the plants. The effect of fertilization given as a treatment can give an answer on the parameters studied.

### b. Effect of Liquid Organic Fertilizer Processed Traditional Market Waste on Fresh Grassland Production *Setaria* (*Setaria splendida*)

The treatment of fertilizer using liquid organic fertilizer of traditional market waste on the average of *Setaria splendida* fresh forage production (*Setaria splendida*) of the fourth defoliation growth stage of 1.03581 kg, in the production range 0.96375 kg - 1.083 kg per square meter. The fresh production can be calculated within one year, 10 times harvest to 103,581 kg per hectare or in the range of 96,375 kg - 108,300 kg per hectare per year (Table 2). The amount of production is in accordance with research [5] which shows that

cassava grass has a production potential of 100,000 - 110,000 kg per hectare per year.

Table 2. Effect of Organic Fertilizer Concentration on Traditional Market Waste on Fresh Grassland Production *Setaria* and Livestock Feeding Power

No	Treatment = Liquid Organic Fertilizer	Fresh Forage (g/m <sup>2</sup> )	Large Livestock Feeding Power (heads)	Small Livestock (heads)
1	D1 = 1:1	1.060,75	14,73	58,92
2	D2 = 1:2	1.083,00	15,04	60,16
3	D3 = 1:3	1.035,75	14,38	57,54
4	D0 = 0:0	963,75	13,38	53,52

Source: Primary data processed.

The results showed that the average production rate of *Setaria* grass fresh production in all treatments showed a narrow range. The result of data analysis showed that the treatment had no significant effect (P> 0,05) on *Setaria* fresh grass fresh production of fourth defoliation growth stage. Based on the results of the analysis stated that although there are differences in the level of production, but considered uniform. However, the D2 treatment of organic fertilizer concentration of organic waste of traditional market given water at 1: 2 ratio shows the highest production rate (1.083 gram per square meter).

*Setaria* grasses that are not fed with liquid organic fertilizers produce an average level of forage production that is not too far from grass fed with liquid organic fertilizer at all concentrations. Observing this suspected liquid organic fertilizer has not been reliable as a material that can be widely used. However, basically the grasses of *Setaria* fertilizers still produce higher production than without the application of liquid organic fertilizer. This is according to the condition of treatment that nutrient content of organic liquid fertilizer traditional market waste is low enough that nitrogen 0,038 percent, P2O5 as much as 81,748 mg / l and K2O 0,134 percent. The nitrogen content of the research field is high enough and added from the organic liquid fertilizer that has been able to meet the nitrogen needs for the production of crops. [4] states that nitrogen nutrients can stimulate increased growth and crop production. Read more [7] added that nitrogen nutrients can spur growth and crop production.

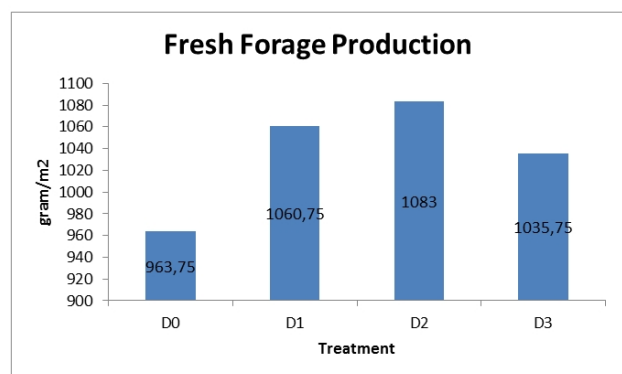


Figure 1. Fresh Grassland Production of Setaria on Dosage of Organic Fertilizer Liquid Waste Traditional Market

At lower concentrations of liquid organic fertilizer the lower traditional market due to more water mixtures, there is a tendency to increase fresh forage production, but there is a decrease again in more mixtures. The condition is in accordance with the results of the study [8] that on planting media with nitrogen content that is high enough, the addition of the liquid organic fertilizer treatment no longer gives a real effect. Even suspected the addition of it did not give effect or in vain. On the too high addition of urea fertilizer according to [9] will even provide toxic effects for plants.

If it is linked to the fact that there is abundant traditional organic waste in some cities and has the potential for further benefit for human life, in order to reduce the level of contamination of traditional market culture, the utilization of liquid organic fertilizer from traditional market waste products remains promising utilized. Although not in feed plants such as grass setaria, hunting [1] is possible use for other crops as well as on the cultivation of various food crops is very promising. It is also possible that liquid organic fertilizer of traditional market waste can be suitable for certain crops, but not suitable for grass plantation.

### c. Effect of Liquid Organic Fertilizer Processed Traditional Market Waste on Livestock Cattle Grade from Setaria Grass (*Setaria splendida*)

Table 2 and Figure 2 show that grasses treated with various doses of liquid organic fertilizer in traditional market waste have provided large livestock and small livestock capacity. Large cattle are cattle and buffaloes, assumed to consume 20 kg per day of cassia grass per cow, while those belonging to small livestock are goats and sheep that are assumed to consume 4 kg of peraria grass per day. The grasses according to [10] Aminudin and Hendarto (2000), can not be given to livestock as a whole the need for green feed, should be mixed with other forages. If a ruminant animal is given forage from single-cropped grasses, in the long run it will impair the physiology of the livestock body, including moulting and other disorders. In relation thereto the maximum giving to large livestock 20 kg per day per head and small livestock 4 kg/day/tail.

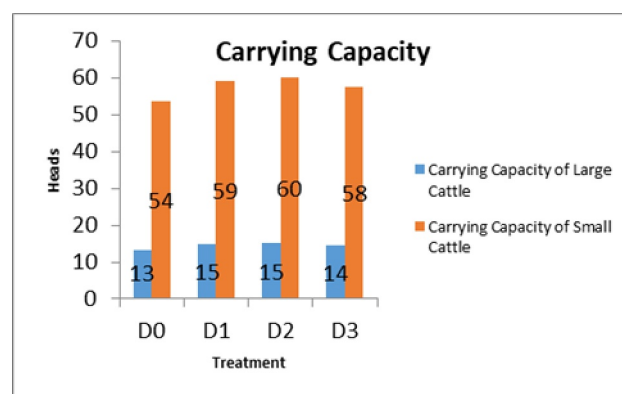


Figure 2. Grass Capacity of Setaria from Fertilizer of Liquid Organic Fertilizer from Traditional Market Waste Processing.

The treatment of D-2 is organic liquid fertilizer resulted from processed organic waste of traditional market by giving 1 part mixed with 2 parts of water giving the biggest livestock capacity that is 15.04 adult cattle (big cattle) or 60,16 goats (small livestock) per hectare per year. If planting 1 hectare of grass, given liquid fertilizer from the mixture of liquid organic fertilizer as much as 1,000 liters and 2,000 liters of water per defoliasi for one year, it can be to maintain adult cows as much as 15.04 heads or adult goat of 60 , 16 heads in the feeding of sliridia feed for cows 20 kg per heads per day and goats 4 kg per head per day. If it can be realized, organic liquid fertilizer processed by traditional market waste can reduce pollution, disruption of comfort and reduce unemployment from organic waste processing business traditional market. In the livestock business can improve the welfare of farmers and the provision of food in the form of meat and improve productivity and social life.

## Conclusion

Based on the discussion that has been done can be concluded:

- 1). The liquid organic fertilizer produced from traditional market waste which is given on *Setaria splendida* can provide fresh forage production of 96,375 kg - 108,300 kg per hectare per year.
- 2). The liquid organic fertilizer produced from traditional market waste that is given on *Setaria splendida* can provide the capacity for adult cattle as much as 13.38 tail - 15.04 head or goat livestock as much as 53,52 tail - 60,16 head per hectare per year.
- 3). The best dose is the administration of 1,000 liters of liquid organic fertilizer mixed with water as much as 2,000 liters per hectare per defoliation.

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