

*Short Communication*

**Effect of different types of organic manure on biomass yield, morphological characteristic's and nutritive value of BLRI Napier-4 in Baghabari milk shed area, Sirajgonj**

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**Abstract:** The trial was conducted at Bangladesh Livestock Research Institute (BLRI) regional station, Baghabari, Shajadpur, Sirajgonj to determine the biomass yield, morphological characteristics and nutritive value with the effect of different sources of organic manure such as biogas slurry, broiler litter and layer litter for fodder production. Significant ( $P<0.05$ ) difference was observed in biomass yield among different treatment group. Biomass yield (t/ha) was in order of biogas slurry (26.80)> fertilizer (26.56)> broiler litter (22.34)>layer litter (22.20). This study also showed that DM yield and survival percentage were also significantly ( $P\leq 0.05$ ) differed among the treatments. The DM% in all groups was mostly similar but DM yield (t/ha) was the highest (3.94) in biogas slurry and the lowest (3.13) in layer litter. The cost (Tk/ha) was significant ( $P<0.01$ ) difference among the treatment group. The highest cost (15856Tk/ha) was observed in fertilizer group and the lowest (5705 Tk/ha) was biogas slurry group. There was no significant ( $p>0.01$ ) effect of different organic manures on nutritive value of BLRI Napier-4. It may be suggested that biogas slurry may be used as sources of fertilizer for fodder cultivation.

**Keywords:** biogas slurry; broiler litter; layer litter

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### **1. Introduction**

The scarcity of fodder is one of the important problems in Bangladesh for rearing dairy cows. To mitigate this problem, BLRI introduced BLRI Napier-4 grass (*Pennisetum purpureum*) in the Pabna and Sirajgonj districts, known as milk shed areas. Despite of increased milk production farmers complained that fertilizer cost is high and its effect on their profit. Fodder cultivators has a good opportunity to use biogas slurry, broiler litter and layer litter, because a good number of biogas plant, broiler and layer farms are already established in the milk shed areas as well as in the country. From the existing biogas plants and farms a lot of slurry and litter are produced in the area. Nitrogen fertilization directly contributes to the quantity and quality of forage production. Excessive and imbalanced use of chemical fertilizers has adversely affected the soil, causing a decrease in organic carbon by reducing the microbial flora in the soil, and increased use of nitrogen fertilizer is contaminating water bodies, thus affecting fish fauna and posing a health hazard for humans and animals (Rahman *et al.* 2008). To consider above situation BLRI regional station set an agronomic trial with the objectives to determine the biomass yield, morphological characteristics and nutritive value with the effect of different sources of organic manure such as biogas slurry, broiler litter and layer litter for fodder production in Baghabari milk shed areas.

## 2. Materials and Methods

### 2.1. Site of the experiment

The trial was conducted at BLRI regional station, Baghabari, Shajadpur, Sirajgonj.

### 2.2. Fodder production trial

Sixteen trial plots of each size 5m X 5m and arranged in 4 blocks having homogenous soil characteristics. The plots were prepared by ploughing. There were four treatment group T<sub>0</sub> (fertilizer) as control, T<sub>1</sub> (biogas slurry), T<sub>2</sub> (broiler litter) and T<sub>3</sub> (layer litter). The BLRI Napier-4 fodder was propagated by stem cutting method. Line to line and plant to plant distance were 70 and 35 cm, respectively. First cut was made 55 days after the establishment.

### 2.3. Chemical analysis of samples

All the samples of feeds and faeces were prepared and sub-samples were used for analysis. The samples were subjected to chemical analysis for the determination of dry matter (DM), crude protein (CP) and ash following the methods of AOAC (1995). The acid detergent fibre (ADF) was determined according to Goering and Van Soest (1970). All the samples were analysed in duplicate and the mean values were recorded.

### 2.4. Statistical analysis

The statistical analysis was done using 'SPSS 11.5' statistical programme to compute analysis of variance (ANOVA) for randomized complete block design (RCBD). Differences among the treatment means were determined by Duncan's Multiple range Test (DMRT) (Duncan, 1955).

## 3. Results and Discussion

### 3.1. Biomass yield and morphological characteristic's

The biomass yield and morphological characteristics of BLRI Napier-4 fodder are presented in Table 1. It was observed that significant (P<0.05) difference was observed in biomass yield among different treatment group. Biomass yield (t/ha) was in order of biogas slurry (26.80)> fertilizer (26.56)> broiler litter (22.34)>layer litter (22.20). Table 1, also showed that DM yield and survival percentage were also significantly (P≤0.05) differed among the treatments. The DM% in all groups was mostly similar but DM yield (t/ha) was the highest (3.94) in biogas slurry and the lowest (3.13) in layer litter. Islam *et. al* (2010) stated that biogas slurry increased biomass yield of maize fodder. Dauden and Quilez (2004) conducted a maize fodder yield experiment using different levels of pig slurry, and observed no significant differences in plant height or biomass yield between the different treatments. The cost (Tk/ha) was significant (P<0.01) difference among the treatment group. The highest cost (15856Tk/ha) was observed in fertilizer group and the lowest (5705 Tk/ha) was biogas slurry group. Fertilizer cost near about 3 times higher in case of chemical fertilizer than that of biogas slurry. The results revealed that biogas slurry was reduced the expenditure of cultivation cost of fodder.

**Table 1. Biomass yield and morphological characteristics of BLRI Napier-4 fodder of different sources of organic manure.**

Treatment group	Biomass yield (t/ha)	%DM	DM (t/ha)	No. of hill (thousand/h a)	No. of tiller/hill	Survival percentage	Cost of biogas slurry/b.lit/l.lit/ferti. (Tk/ha)
Biogas slurry	26.80 <sup>a</sup> ±5.36	14.69±0.98	3.94 <sup>a</sup> ±0.32	21.69±1.11	13.33±0.61	98.51 <sup>a</sup> ±2.21	5705.00 <sup>c</sup> ±21.22
Broiler litter	22.34 <sup>b</sup> ±3.33	14.34±1.10	3.20 <sup>b</sup> ±0.42	21.47±1.34	10.32±0.87	92.56 <sup>b</sup> ±3.69	7187.00 <sup>b</sup> ±19.43
Layer litter	22.20 <sup>b</sup> ±2.98	14.11±0.79	3.13 <sup>b</sup> ±0.09	20.92±0.98	10.21±0.88	91.55 <sup>b</sup> ±4.12	7187.00 <sup>b</sup> ±23.93
Fertilizer	26.56 <sup>a</sup> ±4.87	14.59±1.13	3.87 <sup>a</sup> ±0.45	20.87±2.11	14.44±1.11	97.56 <sup>a</sup> ±4.23	15856 <sup>a</sup> ±29.77
Level of sig.	*	NS	*	NS	NS	*	**

<sup>abc</sup>Mean values in a column with different superscripts differ significantly; NS= Not significant, \*P<0.05, \*\*P<0.01

**Table 2. Chemical composition of BLRI Napier-4 under different types of organic manure.**

Treatment group	%DM fresh basis	% DM basis			ME (MJ/kg DM)
		Ash	ADF	CP	
Biogas slurry	14.69±0.98	11.34±0.69	47.31±1.54	10.68±0.39	9.91±0.08
Broiler litter	14.34±0.56	12.01±0.78	46.12±2.11	10.22±0.45	9.72±0.09
Layer litter	14.11±0.67	11.92±0.98	45.92±1.66	10.67±0.68	9.41±0.10
Fertilizer	14.59±0.76	11.37±0.046	46.22±2.34	11.21±0.76	9.81±0.07
Level of sig.	NS	NS	NS	NS	NS

NS= Not significant, \*P<0.05, \*\*P<0.01

### 3.2. Chemical composition

Table 2 shows that there was no significant ( $p>0.01$ ) effect of different organic manures on nutritive value of BLRI Napier-4. The results also showed that CP content did not effect by the application of different type of organic manure.

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### 4. Conclusions

The performance evaluation of different type's organic manure on perform fodder production will be continued. Therefore, so far obtained revealed that biogas slurry may be used as sources of fertilizer for fodder cultivation in Baghabari milk shed area.

### Conflict of interest

No one to declare

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