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GROWTH RESPONSE OF BEHA GRASS *(Brachiaria humidicola)* FERTILIZED WITH GOAT MANURE

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ABSTRACT

This study aimed to determine the best dosage of goat manure as a natural fertilizer on Beha grass (*Brachiaria humidicola*). This study used 64 poles of Beha grass grown in polybags divided into 16 plots, and it used a completely randomized design (CRD) to analyze the data. This study consist of 4 treatments that is P0 (0 ton/ha of goat manure), P1 (10 ton/ha of goat manure), P2 (15 ton/ha of goat manure), and P3 (20 ton/ha of goat manure). This study's variables were plant height, number of leaves, numbers of tillers, new production, and root length. Data analysis used ANOVA variance continued with real honest difference test. The result of this study showed that averages of plant height (cm) were P0=26, P1=50.5, P2=51.5, and P3=52.75. Averages of the number of leaves were P0=22, P1=110, P2=160, and P3=185. Averages of numbers of tillers were P0=7, P1=25, P2=37, and P3=38. Averages of new production (g) were P0=17.75, P1=123.5, P2=178, and P3=192.25. Averages of root length (cm) were P0=37.8, P1=39.5, P2=41.775, and P3=49.5. Fertilization with natural fertilizer from goat manure has a genuine effect ($P<0.01$) on the growth of Beha grass. The best dosage of fertilization with goat manure was 15 ton/ha.

Keywords: Goat manure, Beha (*Brachiaria humidicola*) grass, growth.

INTRODUCTION

The types of forage that are very familiar to breeders are grass - grasses and legumes. One of the grasses known to breeders is Beha grass (Brachiaria humidicola). Beha grass (Brachiaria humidicola) is a palatable forage and can also be cut hay and pasture. This grass can suppress weed growth but is suitable for low irrigation. It is tolerant of heavy grazing and can grow with low soil fertility, so it has a large enough role for the provision of forage and livestock development in the tropics.

The availability of nutrients in the soil is an essential factor in determining the growth of forage. The most popular types of ground known by the community, especially farmers and breeders, are a). Clay, b). Sand soil, c). Peat soil, d). Sediment soil, e). Karanji soil (dry and salty), f). Loam (loose) soil. Of the six types of soil, they have their respective advantages and disadvantages, both in nutrient content and water absorption. Therefore, soils lacking in nutrients need to be added with nutrients in the form of fertilization such as manure from livestock waste. Apart from being high in nutrients contained in manure. Therefore, it is very appropriate that manure is used as fertilizer for grass plants and being cheap and easy to obtain by breeders.

Beha grass (Brachiaria humidicola) is a type of grass classified as fast-growing if supported by nutrients, micro, and macronutrients. Also, loose soil and sufficient and balanced water content in the ground will support the growth of Beha grass (Brachiaria humidicola) properly.

Organic fertilizer application is an alternative in improving soil physical, chemical, and biological properties. Manure is a waste product from domesticated livestock that can add nutrients, improve soil physical properties, soil chemistry, and soil biology. Manure is divided into several types, including chicken manure, cow manure, goat manure, horse manure, and other livestock manure. Each animal produces many kinds of waste; feces of every sort' nutrient content are different based on livestock.

Based on this description, it is necessary to research to see the response to the growth of Beha grass (Brachiaria humidicola), which is given manure from goat manure.

RESEARCH METHODS

This research was conducted at the Agrostology Field Laboratory, Department of Animal Husbandry, Faculty of Animal Husbandry, Halu Oleo University Kendari. The materials used in the study were 64 pols of Beha grass (Brachiaria humidicola) tillers (pols). Research required (64 units of polybags) the size of one polybag with another polybag 40 x 40 cm in one treatment stack. The distance between one treatment arrangement and another treatment is 100

cm. The greenhouse used in this study is 820 cm x 820 cm wide. Soil is put into a polybag containing 20 kg of soil.

The research design used was a completely randomized design (CRD) with four treatments and four repetitions. = 15 tons / ha (150 grams of goat manure / polybag), P3 = 20 tons / ha (200 grams of goat manure / polybag). The variables observed in this study were plant height (cm), number of leaves (strands), number of tillers (stems), new production (gr), and root length (cm). If there is a difference between the treatments, a further test is carried out with the Honest Real Difference Test.

RESULTS AND DISCUSSION

Table 1. Average plant height, number of leaves, number of tillers, new production, and Beha (Brachiaria humidicola) grassroots.

Variable	Treatment			
	Control	10 ton/ha	15 ton/ha	20 ton/ha
Plant height (cm)	26^{b}	$50,5^{a}$	$51,5^{a}$	$52,75^{a}$
Number of leaves (sheet)	22^{c}	110^{b}	160^{ab}	165^{a}
Number of tillers (stem)	7^{c}	25^{b}	37^{a}	38^{a}
Fresh produce (gr)	$17,75^{c}$	$123,5^{b}$	178^{ab}	$192,25^{a}$
Root Length (cm)	37,8	39,5	41,775	49,5

Note: Superscripts with different letters on the same line indicate a very significant effect (P <0.01) and without letters indicate no significant effect (P> 0.05)

Plant height

The variance analysis showed that the application of manure from goats had a very significant effect (P <0.01) on the height of the Beha grass plant. Waste affects the growth of Bra grass (Brachiaria humidicola) because bra grass is very responsive to fertilizer. Nutrient elements in livestock manure are highly dependent on the type of livestock, feed, the nature of the waste, the highest method of storage, processing, and use. This seems to be related to the content of the elements N, P, and K in goat manure. The element nitrogen (N) serves to stimulate overall plant growth, primarily plant stems. Phosphor (P) has a function of root growth, especially in young grass plants (Setiawan, 2005). Elemental potassium (K) plays a role in forming protein and carbohydrates for plants. The increase in plant height is influenced by carbohydrates produced from the photosynthesis process in the presence of nitrogen, which is more widely used to form the plant's vegetative parts so that the plant grows taller. These high nutrient elements are essential for plants that function to increase the growth and production of forage crops. The application of nitrogen fertilizers will increase the growth of plant parts (Agustian, 2004).

Number of Leaves

The results showed that manure's application from goats had a very significant effect (P <0.01) on the number of Beha grass leaves. The manure application affects the average number of leaves of Beha grass (Brachiaria humidicola) because it is influenced by spacing, light intensity, phosphorus, and nitrogen elements derived from manure. The provision of waste from goats plays a vital role in grass growth. Alfaro and Salazar (2008), Salendu, et al. (2012) stated that the integrated use of manure from livestock manure has a better effect on the soil, on aspects of conservation and plant growth. The large number of leaves produced in each treatment was related to the large number of tillers due to the influence of manure from goats. This is indicated by an increase in the photosynthesis process with the increasing number of leaves.

Number of tillers

The results showed that manure's application from goats had a very significant effect (P <0.01) on the number of Beha grass tillers. Many tillers are usually influenced by the growing medium, seeds, and nutrients N and P, the photosynthetic process that occurs in plants. Sunlight is very influential on plant saplings, namely, the higher the sunlight, the more the number of tillers (Wong, 1991). The nutrients present in goat manure are readily available for plants. Giving waste from goats can increase the number of tillers. Nutrients found in feces and the soil are sufficient and balanced to increase the number of Beha grass (Brachiaria humidicola) tillers. Apart from being determined by the availability of macro and micronutrients for plants, the growth and development of a type of plant must be available in a balanced state in the soil (Sutejo, 2002; Pangaribuan, 2010).

Produksi Segar

The results showed that the application of manure from goat livestock had a very significant effect (P <0.01) on the new production of Beha grass. Plants will grow

and develop by utilizing essential nutrient elements contained in the soil or from the doses of goat manure; plants absorb these nutrients for growth and production. This is related to the content of the elements N, P, and K in goat manure. The availability of nutrients plays a vital role in plant growth. Plants function to increase forage production. The higher the dose of goat manure used, the higher the soil nutrient content, where goat manure is in addition to macro and micronutrients, so it is best used as organic fertilizer (Setiawan, 2005). The availability of adequate and balanced nutrients will affect the growth and new production of plants. A reasonable decomposition rate will provide nutrients in the soil, especially N, PK, and other nutrients, and improve soil structure (Hidayah, 2003) and (Marliani, 2010). Plant roots will develop well, and seeds can absorb more nutrients, especially N, which will increase chlorophyll formation so that photosynthetic activity can grow and increase plant height.

Panjang Akar

The results showed that the application of manure from goats had no significant effect (P> 0.05) on the Beha grass's root length. Giving waste from goats by giving treatment doses is not a limiting factor for dosing manure from goats. This is because manure's nutrients are mostly used for the vegetative growth of the upper plants (plant height, number of tillers, and number of leaves) or new production. The carbohydrate elements that have been formed have not been channeled for root growth.

The treatment had no significant effect (P> 0.05) on root length, but the measurement results indicated that the higher the fertilizer dose, the longer the root length increased. The plant root growth phase will begin when the top plant growth has reached its peak. Root length growth is not significant because hormone production, especially auxin, has a minimal role at the beginning of the development. Wattimena (2002) states that auxin as a growth hormone has a physiological influence on aspects of development and growth, including cell enlargement, root formation, a level of auxin concentration that is not too high will stimulate root growth properly if it is not suitable then the inhibitor of side shoots, development of the eye side shoots can be stunted.

CONCLUSION

The application of manure from goat livestock had a significant effect (P <0.01) on height, number of tillers, number of leaves, and a new production of Beha grass (Brachiaria humidicola). The best dose of manure from goats for growth is 15 tonnes/ha.

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