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THE EFFECT OF FERTILIZER BOKASHI SLUDGE BIOGAS LEAF GAMAL (*GLIRICIDIA SEPIUM*) WITH DIFFERENT LEVELS ON THE EARLY GROWTH OF LAMTORO TARRAMBA PLANT AGED 6 WEEKS

By
Lambu Emu[1], I Made Adi Sudarma[2]
[1,2] Sains and Technology Faculty, Unkriswina Sumba
E-mail: [2]made@unkriswina.ac.id

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Abstract: *This study aims to determine the effect of giving bokashi sludge biogas from gamal leaves with different levels on the growth of the lamtoro tarramba plant. The experimental design in this study used a completely randomized design (CRD) to make 20 experimental units using 5 treatments and 4 replications. The treatments used were P0 (control) without fertilizer application, P1 (250) grams, P2 (500) grams, P3 (750) grams and P4 (1000) grams. The results of this study showed that the application of bokashi sludge biogas and gamal leaves fertilizer had a significant effect (P<0.05) on the height, stem diameter and number of compound leaves (strands) on the lamtoro plant. It can be concluded that offering bokashi sludge biogas and gamal leaves up to a level of 750 grams is able to give the best results in the initial growth of lamtoro tarramba.*

INTRODUCTION

Ruminant livestock such as cattle, buffalo, goats and sheep are growing quite rapidly in East Sumba Regency. The livestock population in East Sumba in 2020 has increased (in the last 4 years), where the cattle population in East Sumba is 65,693 with an increase of 15%; buffalo livestock population of 44,007 with an increase of 14%; the population of goats and sheep is 63,442 with an increase of 14% (1). One of the reasons for the increase in the ruminant livestock population is because East Sumba still has quite a large area of land that can be used as cattle breeding land.

One that supports the success of a livestock business is the provision of feed. Feed is the most important main part that determines the success of a livestock business because feed plays an important role in increasing livestock productivity. The cause of the problems faced by breeders today is the lack of knowledge about land use for forage for livestock. Forage is forage for livestock and this forage has an important role in the development and productivity of livestock. One that has the potential to be used as animal feed is lamtoro.

Lamtoro (*Leucaena leucocephala*) is a feed that contains high protein, calcium and energy. According to (2) reported that lamtoro has a nutritional content of BK 89.19%, BO

92.36%, PK 22%, 41%, LK 6.56%, SK 13.50%, CHO 63.39, BETN 49 .88%. Lamtoro is a feed that has enough potential to be used as animal feed.

One alternative that can be developed to increase the growth of lamtoro plants is the manufacture of bokashi sludge biogas gamal leaf fertilizer. This bokashi fertilizer is made from organic materials, both biogas sludge, rice mill waste (husk and bran) which are fermented with EM4. Sludge biogas is very good as a medium for making bokashi fertilizer where the use of sludge biogas as the main organic ingredient for bokashi fertilizer has been reported on the growth of odot grass plants (3; 4). Gamal leaves have different advantages from other plants, Gamal leaves have a high nitrogen content of around 3.15%. According to (5), the leaf tissue of the gamal plant contains 3.15% N, 0.22% P, 2.65% K, 1.35% and 0.41% Mg. One of the technologies that can be used to increase the growth of lamtoro plants is the application of fertilizers. Biogas bokashi sludge fertilizer with the addition of gamal leaves is expected to have a high nutrient content which can enrich the nutrients of the organic fertilizer that will be given.

RESEARCH METHODS

This research was conducted from January 2022 to March 2022 in the Kawangu Village, Pandawai District, East Sumba Regency. The materials and tools used in this study were biogas sludge, EM4, water, methamphetamine sugar, polybags, lamtoro seeds, gamal leaves, feces, rice husk charcoal, bran, plastic buckets, scoops, tarps, machetes, scales, cameras, thermometers, drums water, sack, rope, HVS paper, ballpoint pen, caliper.

The experimental design in this study used a completely randomized design (CRD) to make 20 experimental units using 5 treatments and 4 replications. The treatments tested are as follows: P0: Lamtoro tarramba plants grown without fertilizer application; P1: Lamtoro tarramba plants grown by applying bokashi sludge biogas fertilizer from gamal leaves at a dose of 250 gr/polybag; P2: Lamtoro tarramba plants grown by applying bokashi sludge biogas fertilizer from gamal leaves at a dose of 500 gr/polybag; P3: Lamtoro tarramba plants grown by applying bokashi sludge biogas gamal fertilizer at a dose of 750 gr/polybag; P4: Lamtoro tarramba plants grown by applying bokashi sludge biogas gamal leaves fertilizer at a dose of 1000 gr/polybag.

The variables examined in this study are: 1. Plant Height: Plant height can be measured by showing the planting median according to the height of the lamtoro plant starting from the soil surface to the tip of the leaf since the first week which is done every two weeks; 2. Stem Diameter: Stem diameter can be measured at the base of the stem from the soil surface with 10 cm in lamtoro tarramba plants; 3. Number of compound leaves (strands): The number of leaves is counted for all leaves including compound leaves which are on each plant stem in a polybag which is done once in 2 weeks after being transferred to a polybag. The data obtained were analyzed by analysis of variance (ANOVA). Differences between treatments were tested using Duncan. Data were analyzed using SPSS.

RESULT

Table 1. The height, stem diameter and number of compound leaves of the Lamtoro Tarramba plants was observed in the 6th week

Perlakuan		Variable	
	Plant height	Stem diameter	Number of Compound Leaves
P0(control)	19,00[a]	2,33[a]	8,66[a]
P1(250)	25,00[a]	3,03[ab]	63,66[ab]
P2(500)	27,66[bc]	3,26[bc]	74,66[ab]
P3(750)	30,33 [c]	3,60[c]	83,33[b]
P4(1000)	21,33[ab]	2,63[ab]	54,66[ab]

Note: numbers followed by different superscripts in the same column show a significant difference (P<0.05)

The height of the lamtoro tarramba plant shows that by applying bokhasi sludge biogas fertilizer, gamal leaves at different levels can affect the growth of the lamtoro tarramba plant. Based on Table 1. it shows that the treatment with the application of gamal leaf biogas bokashi sludge fertilizer had an effect on the growth of lamtoro plants, where the best level was at the 750gram level and it was seen that the application of gamal leaf bokashi fertilizer was sufficient at 750gram treatment which was the best level given to lamtoro tarramba plants, this is because the content and nitrogen from gamal leaves are good enough for plants.

The results of observations of plant height in the 6th week showed that the application of bokashi sludge biogas fertilizer on gamal leaves at the 500 gram and 750gram bokashi levels was significantly different (P<0.05) plant size was higher than the P0 level (control) without fertilizer application, 250 grams, 750 grams and 1000 grams/polybag. According to (6) the highest lamtoro research results were given chicken feces bokashi fertilizer in the 750gram treatment with a plant height of 43.51 cm and can be compared with his research (7) showed the highest lamtoro research results in the 6th week with a height of 36.4 cm. From the results of the comparison between the studies above, it can be concluded that the higher the bokashi fertilizer treatment, the higher the lamtoro plant because the bokashi fertilizer given contains high nitrogen.

The diameter of the stem is the length of the line between two points on the circle around the stem that passes through the center of the axis/bar. Stem diameter was measured at 10 cm underground with calipers. According to (8) suggested that the age of the plant can affect the size of the stem diameter, when the age of the plant increases, the diameter of the stem also increases. Based on table 1. it shows that the application of bokashi sludge biogas fertilizer from gamal leaves has an effect on the diameter of the lamtoro tarramba plant. This is presumably due to the presence of a fairly good nutrient content in the plant so that it can have a significant effect on the 750gram treatment.

The highest diameter observed results in week 6, which can be seen in the 750gram bokashi fertilizer treatment which produces the largest diameter of 3.60 mm. It can be seen that the 750gram treatment always gives the highest average yield compared to the P1 and P4 level treatments. not significant (P>0.005) on stem diameter of lamtoro tarramba plants. It is suspected that the application of gamal leaf bokashi fertilizer does not have a

significant significant effect on plant stem diameter. Compared to his research (9) it showed the highest results for plants using compost fertilizer in the 750gram treatment of 10.66 mm. It can be concluded that the use of bokashi fertilizer can affect plant diameter.

The number of leaf blades is one of the parameters used in determining crop production. Based on table 1. it shows that the application of bokashi sludge biogas fertilizer for gamal leaves has an effect on the number of leaves of the lamtoro tarramba plant. The highest treatment was at the level of 750 grams.

Observations on the application of bokashi sludge biogas fertilizer on gamal leaves in the 6th week showed that the number of leaves had a significant effect (P <0.05) the lowest treatment was in the treatment without fertilizer while the highest was produced in the treatment with 750gram bokashi sludge biogas fertilizer which produced a total of 83.33 leaves. The treatment between levels of 250 grams, 500 grams and 1000 grams gave no significantly different effect (P> 0.05) but was different from P (control) without fertilizer application. The high number of leaves in the 750gram treatment was due to the high amount of nitrogen provided by the plants. When compared with the research by (7) it shows the results that in the 6th week with the highest number of leaves, namely 25.4 strands, it can be compared with the results of their research by (6) showing the results that the lamtoro plants treated with bokashi fertilizer at a level of 750 grams gave the best results with the highest number of strands 59.18, meaning that the higher the amount of fertilizer given to the plants, the resulting increase in the number of leaves.

CONCLUSION

It was concluded that the application of bokashi sludge biogas fertilizer for gamal leaves (*Gliricidia sepium*) had a significant effect on the growth of the lamtoro tarramba plant. Gamal leaf bokashi fertilizer can be given up to a level of 750 grams/polybag on lamtoro tarramba plants.

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