

Growth of Odot Grass (*Pennisetum purpureum* cv. Mott) on Sandy Marginal Land on Payung Island Kepulauan Seribu Jakarta

(Pertumbuhan Rumput Odot (*Pennisetum purpureum* cv. Mott) pada Lahan Marjinal Berpasir di Pulau Payung Kepulauan Seribu Jakarta)

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ABSTRACT

Odot grass (*Pennisetum purpureum* cv. Mott) is a potential forage to be developed in order to guarantee goats feed in Payung island, Kepulauan Seribu Regency, DKI Jakarta province. The purpose of this study was to determine the effect of fertilizer treatment on growth and forage production odot grasses, namely the treatment of organic fertilizer in the form of goat urine and the treatment of commercial inorganic fertilizers, namely NPK fertilizer. This study was in the form of a field trial using a randomized block design with three treatments and six replications. The treatments were 1) Goat urine fertilizer 500 ml per clump; 2) NPK fertilizer 5 grams per clump and 3) Control (without fertilizer). Goat urine was taken from the location of the goat pen that has been stored for two months fermentation increased nutrient quality. Fertilization with goat urine organic fertilizer on odot grass gave vegetative growth and forage production responses as well as the use of NPK commercial inorganic fertilizers.

ABSTRAK

Rumput odot (*Pennisetum purpureum* cv. Mott) merupakan hijauan pakan ternak kambing yang sangat potensial untuk dikembangkan agar dapat menjamin ketersediaan pakan kambing di Pulau Payung, Kabupaten Kepulauan Seribu, Provinsi DKI Jakarta. Tujuan penelitian ini untuk mengetahui pengaruh perlakuan pemberian pupuk terhadap pertumbuhan dan produksi hijauan rumput odot dengan perlakuan pemberian pupuk organik berupa urin kambing dan pemberian pupuk an-organik komersil NPK. Penelitian ini berupa percobaan lapangan menggunakan Rancangan Acak Kelompok (RAK) dengan tiga perlakuan dan enam kelompok. Perlakuan tersebut adalah: 1) Pupuk urin kambing 500 ml per rumpun; 2) Pupuk NPK 5 gram per rumpun, dan 3) Kontrol (tanpa pupuk). Urin kambing yang digunakan diambil dari lokasi kandang kambing yang sudah disimpan selama dua bulan masa fermentasi untuk meningkatkan kualitas hara. Pemupukan dengan pupuk organik urin kambing pada rumput odot memberikan respon pertumbuhan vegetatif dan produksi hijauan yang sama baiknya dengan penggunaan pupuk komersial NPK an-organik.

Kata Kunci:
Pemupukan
Rumput odot
Lahan Marjinal

1. Introduction

Odot grass (*Pennisetum purpureum* cv. Mott) is one of the varieties of elephant grass, abroad often known as *Dwarf Elephant Grass* or *Mott Elephant Grass*. This odot grass is another name in Indonesian is dwarf elephant grass or mini elephant grass, but in most classes of goat and sheep breeders better known as odots. The vegetative part of the leaves and stems of the grass feels softer so that it is favored by goats and sheep (Sarwanto & Tuswati, 2017) and available of goat feed (Kaca, Suariani, Suwitari, & Sanjaya, 2019). Odot grass can grow on marginal sandy land with good fertilization. Fertilization problems need to find an alternative to cheap fertilizers so as to reduce production costs. One way that can be reached is by fertilizing using goat urine organic fertilizer (Syamsuddin, 2016). The presence of goats will contribute to fertilizer in an integrated manner for odot grass and vice versa odot grass can grow and develop for goat feed. To breed grass can be done by vegetative methods, which is replanting with stems or using branching samplings that grow best (Sirait, 2017). Cutting on these branches is done with a tool that can be used to cut on the stem, cutting is done on the stem which will become plant material (Noorrohmah, Al Hafiizh, & Ermayanti, 2017), cuttings with a length of approximately 15-30 cm (Djufri, 2016) and planting space varies 50 × 80 cm (Hidayanto, Astuti, & Amin, 2019), 80 × 80 cm (Kusdiana, Hadist, & Herawati, 2017), 75 × 35 cm (Hendarto, Qohar, Hidayat, Bahrun, & Harwanto, 2020). Odot grass is first harvested since it is planted at the age of 70-80 days. Some characteristics that can be shown when the grass is available for the stem segment has reached a size of 15 cm. For the next harvest age can be 35 – 45 days in the rainy season or 40-50 days in the dry season. It also depending on the conditions can be between 60 – 90 days (Pratama, 2018).

Thousand Islands is a group of small islands stretching from the Bay of Jakarta to a group of islands around the bay with an ocean area of 6,997.50 km² and an area of 8.76 km². The island consists of 110 islands and consists of 11 income islands, namely islands, then 9 public tourism islands, 36 other tourist islands and 2 islands are Nature Reserve islands. The population of the Thousand Islands is 20,376 people with an average growth of 1.101 %, most of the people's livelihoods are fishermen. The average air temperature in the Thousand Islands between 28.43 – 28.9 °C and relatively high humidity that is 76.52 % (BPS, 2020).

Land in small islands in Kepulauan Seribu District, DKI Jakarta Province, which is predominantly sandy texture, is classified as marginal land for the cultivation of cash crop plants which is minimal and does not hold air well. Water that is poured into plants will quickly absorb so that the plants dry quickly. The condition of sandy soil that is multiplied as marginal land for crop cultivation. According to Saputro (2015) that sand soil is soil that contains very little clay, dust and nutrients. It is planned that the sand will easily drain the air, around 150 cm per hour. Expected, the ability of the soil to store water is very low, which is 1.6 – 3 % of the total available air.

The use of goat urine as organic fertilizer on odot grass is to take advantage of local resources that are available and cheap compared to buying inorganic fertilizers which are expensive, especially when their availability is sometimes limited and difficult to obtain. The aim of this study was to determine the effect of fertilizer treatment on growth and forage production odot grasses, namely the treatment of organic fertilizer in the form of goat urine and the treatment of commercial inorganic fertilizers, namely NPK fertilizer.

2. Material and Methods

2.1. Land Preparing

Processing in sandy soil was quite easy due to the light texture of the soil so that it was easily processed using a hand tractor. The land was processed twice and once to flatten and make trenches and plot boundaries.

2.2. Materials

Odot grass was introduced as one of the goat's forage feed. Before planting the odot grass was done tillage. Anglo Nubian x Etawa was goat cross breed (Aziz, Atabany, & Praharani, 2018) these goat introduced on Payung Island. Liquid manure of goat urine used was the urine that has been allowed to stand for 2 months. The composition of urine and water was 1 litre of goat urine mixed with 4 litre of water so that the amount of 5 litre was given for 10 clumps of odot grass plants or 500 ml per clump. Commercial NPK fertilizer that was prepared was commercial fertilizer with a certain brand that is given as much as 5 grams for 1 clump of odot grass was given once during the experiment.

2.3. Experimental Design

This experiment used 3 treatments and 6 replications in randomized block design with blocking soil elevation. The treatments were 1) Treatment of goat urine fertilizer; 2) Treatment of NPK fertilizer and 3) Control (without fertilizer). The area used was $\pm 200 \text{ m}^2$. The size of one plot was $2 \text{ m} \times 5 \text{ m}$, the spacing of grass $0.5 \text{ m} \times 1 \text{ m}$ with one cutting per hole. For maintenance, replanting dead plants and watering daily.

2.4. Collection and Data Analysis

Data collection on odot grass after 60 days of treatments include: 1) number of tillers, counting the number of tillers in one clump; 2) number of leaves, counting the number of leaves in one clump; 3) leaf length; calculate the length of the leaves in one clump and 4) fresh forage production, weigh forage in one clump. Observations were made by counting the number of tillers, the number of leaves and the length of leaves in one clump of odot grass plants, and the

production of fresh forages. Data collected were analyzed by analysis of variance and followed by the LSD test (La Daha, 2011).

3. Result and Discussion

Goat urine organic fertilizer showed that significant differences on the number of tillers, number of leaves, leaf length and forage production were presented in Table 1. The effect of goat urine organic fertilizer compared to NPK inorganic fertilizers on the number of odot grass tillers, while the effect of both compared with the control shows a real difference. Goat urine organic fertilizer is as useful as NPK inorganic fertilizer, which is to increase the number of odot tillers from an average of two puppies per clump in the control treatment to an average of 6 puppies per clump in the treatment of goat urine fertilization and an average of 6 tillers NPK fertilization treatment.

Table 1. Effect of fertilizer type treatment on number of tillers, number of leaves, leaf length and forage production of odot grasses

Treatments	Number of tillers (bud)	Number of leaves (blade)	Leaf length (cm)	Forage production (kg/100m ²)
Goat urine organic fertilizer	6.6 \pm 3.7 ^b	37.7 \pm 12.6 ^b	50.7 \pm 4.3 ^b	16.16 ^b
NPK inorganic fertilizers	6.1 \pm 2.9 ^b	45.3 \pm 21.1 ^c	41.2 \pm 4.8 ^a	16.66 ^b
Control (without fertilizer)	2.8 \pm 1.5 ^a	22.7 \pm 9.7 ^a	40.3 \pm 8.0 ^a	9.66 ^a

Note: The superscript in the same column show significant differences ($P < 0.05$)

Table 1, showed that the effect of fertilizer treatments using goat urine organic fertilizer compared with NPK inorganic fertilizer not significant difference on number of tillers and forage production, while number of leaves and length showed significant difference. This mean that goat urine organic fertilizer can be used as an alternative to fertilizing odot grass. Susmita, Kalsum, & Wadjdi (2019) argues that organic fertilization increases forage production.

The effect of goat urine organic fertilizer compared with NPK inorganic fertilizers and compared with control on odot grass leaf length was significantly different, while the effect of NPK inorganic fertilizer compared with control showed no real effect. Goat urine organic fertilizer increases the length of leaves of odot grass from an average of 40 cm in leaf length per clump in the control treatment to an average of 50 cm in leaf length per clump in goat urine treatment. According to Syamsuddin (2016) the use of liquid organic fertilizer of fermented goat urine can improve the growth of mini elephant

grass in dry-critical land by 120 ml/plot (10 m²). According to Kurniawan, Ginting, & Nurjannah (2017) NPK content in 300 ml goats urine fertilizer urine nitrogen 0.69 %, phosphor 2.09 % and potassium 0.64 %. The same thing nutrient content was reported by Allwar & Pranata (2013).

The effect of goat urine organic fertilizer compared with NPK inorganic fertilizer on odot grass forage production was not significantly different, while the effect of both compared with control showed a real difference. Goat urine organic fertilizer is as useful as NPK inorganic fertilizer, which is to increase the production of odot grasses from an average of 9 kg/100 m² per clump in the control treatment to an average of 16 kg/100 m² per clump in the urine treatment of goats and is flat average 16 kg/100 m² in NPK treatment.

The growth and production of odot grass will be higher. According to Sarwanto & Tuswati (2017) the provision of compost of goat manure as much as 1.6 kg/m² showed significantly better

results on the growth and forage production of dwarf elephant grass in the former limestone quarry. The same thing was reported by Abdullah, Budhie, & Lubis (2011); Rifai, Rianto, & Susilowati (2018); Hadirin, Hanafi, Rahmawati, & Sadeli (2019); Purnamasari & Zulfarosda (2019).

This study also conducted a composite samples all treatment of odot forage grass to

further proximate analysis (Table 2) in a laboratory to determine the nutrient content of odot forage grass. The results of the odot grass nutrient analysis show that the crude protein content is quite high at around 21 %. The content of feed protein is one of the references to the quality level of a type of feed.

Tabel 2. Proximate analysis of odot grass nutrient content

Forage	Water content g/100 g	Crude Protein g/100 g	Fat g/100 g	Energy Kcal/kg	Fiber g/100 g	Ash g/100 g	Ca g/100 g	P g/100 g
Odot grass	8.39	21.16	4.02	3370	26.64	16.62	0.95	0.34

Note: This data only applies to sample snippets sent to laboratories. Balitnak Ciawi, West Java.

4. Conclusion

Fertilization with goat urine organic fertilizer on odot grass responds to vegetative growth and forage production as well as the use of NPK commercial inorganic fertilizers.

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