UNIVERSITI PUTRA MALAYSIA

COMPARISON BETWEEN PROCESSED AND UN-PROCESS LIVESTOCK MANURE APPLICATION ON *Pennisetum purpureum* GROWTH PERFORMANCE

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FP 2016 103

CERTIFICATION

This project entitled "Comparison between Processed and Un-Process Livestock Manure Application On *(Pennisetum purpureum)* Growth Performance" was prepared by Najiy Shahman bin Roslan and submitted to the Faculty of Agriculture in fulfilment of the requirements of the course SHW 4999 (Final Year Project) for the award of the degree Bachelor of Agriculture (Animal Science).

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ACKNOWLEDGEMENT

Bismillahirrahmanirrahim. Firstly, I want to thank the Almighty God, Allah S.W.T. All glory to Allah S.W.T for giving me strength and the perseverance to do my best in completing this project.

I would like to give a lot of appreciation to my project supervisor, Dr. Tee Tuan Poy, Department of Animal Science, Faculty of Agriculture, Universiti Putra Malaysia for her help and guidance in completing my study. A lot of thanks to my beloved family for their support throughout my project.

I would like to give my great gratitude to all the staffs of Ladang 16, Ladang 2, Ladang 10, Universiti Putra Malaysia due to their cooperating and helps providing materials and facilities during my study.

Also a lot of thanks to all my friends who have helped me in many ways in conducting my research.

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LIST OF ABBREVIATIONS

ADF	Acid Detergent Fibre
CF	Crude Fibre
Cfat	Crude Fat
CP	Crude Protein
DM	Dry Matter
K	Potassium
LL	Leaf Length
LN	Number of Leaves
LW	Leaf Width
LW	Weight of Leaves
MF	Mineral Fertilizer
N	Nitrogen
NDF	Neutral Detergent Fibre
NFE	Nitrogen Free Extract
OM	Organic Matter
P	Phosphorus
P-C	Processed Cattle Manure
P-CH	Processed Chicken Manure
P-G	Processed Goat Manure
PH	Plant Height

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ABSTRACT

COMPARISON BETWEEN PROCESSED AND UN-PROCESS LIVESTOCK MANURE APPLICATION ON *Pennisetum purpureum* GROWTH PERFORMANCE

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(NAME OF SUPERVISOR: DR. TEE TUAN POY)

Increasing intensive livestock farming system has contributed huge amount of animal waste in Malaysia livestock production. Production of livestock waste that are not handled appropriately has contributed negative effect to the environment. The abundant of livestock farming has been increasing the manure production thus contribute to soil and water pollution as well as excessive nutrient discharge that contaminate soil should be corrected. One of the way to utilize it is by converting it as a resource of nutrient for plant uptake. This can also be a step towards organic farming that encompasses the usage of organic fertilizer rather than inorganic in supplying the nutrients needed for plantation. A study was carried out to make comparison of different animal manure and determine the effect of un-process and processed animal manures on *Pennisetum purpureum* (Napier grass) growth

performance. Seven types of treatments namely control treatment (T7, mineral fertilizer applied), unprocessed cattle manure (T1), processed cattle manure (T2), unprocessed goat manure (T3), processed goat manure (T4), unprocessed chicken manure (T5) and processed chicken manure (T6), and each treatment had five replicates. The parameter in terms of physical analysis (plant height (PH), leaf length (LL), leaf width (LW), number of leaves (LN), weight of leaves (LW), weight of stem (SW) and weight of plants (PW)) and chemical analysis (crude protein (CP), crude fibre (CF), nitrogen (N), phosphorus (P) and potassium (K)) were done to determine the most effective fertilizers. Generally, physical analysis indicates that processed animal manure had better performance compared to the un-process animal manure particularly in T2, T4 and T6 ($p > 0.05$). However processed animal manure shows better results in nutrient composition. In particular case, T2 shows the best results in each physical analysis parameters, (PH, LL, LN, LW, SW and PL) while unprocessed chicken manure (T5) shows the least value in all of them. As for the nutrient value (CP, CF, N, P and K), processed chicken manure (T6) shows the best results in all of them. Among all the treatment results, processed cattle manure show the highest Napier growth performance. Chicken manure results indicates high good crude protein and low crude fibre content, however it is not recommended to use chicken manure as the Napier plant growth is not promising. In conclusion, processed animal manure should be practice as it could increase Napier quality, better moisture content of plantation medium and higher availability of nutrient content for the Napier plant. However, more cutting and better management practices must be done using organic fertilizer to get better results and implementation.

ABSTRAK

PERBANDINGAN ANTARA NAJIS HAIWAN YANG TIDAK DIPROSES DENGAN BELUM DIPROSES PADA PRESTASI PERTUMBUHAN RUMPUT NAPIER (*Pennisetum purpureum)*

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Penyelaras Projek: DR. TEE TUAN POY

Peningkatan ladang ternakan secara intensif telah menyumbang kepada penghasilan sejumlah besar sisa haiwan dalam pengeluaran ternakan Malaysia. Pengeluaran sisa ternakan yang tidak dikendalikan dengan sewajarnya telah menyumbang kesan negatif kepada alam sekitar. Jumlah ladang ternakan yang semakin meningkat menyebabkan peningkatan pengeluaran sisa sekali gus menyumbang kepada pencemaran tanah dan air serta pelepasan nutrien berlebihan yang mencemarkan tanah perlu diperbetulkan. Salah satu cara untuk menggunakan ia adalah dengan menukarkan ia sebagai sumber nutrien untuk pengambilan tumbuhan. Ini juga boleh menjadi satu langkah ke arah pertanian organik yang merangkumi penggunaan baja organik dan bukan organik dalam membekalkan nutrien yang diperlukan untuk pertanaman. Satu kajian telah dijalankan untuk membuat

perbandingan baja haiwan yang berbeza dan menentukan kena najis haiwan yang belum dan telah diproses pada prestasi pertumbuhan *Pennisetum purpureum* (rumput Napier). Tujuh jenis rawatan iaitu rawatan kawalan, T7 (baja mineral digunakan), najis lembu yang belum diproses (T1), najis lembu yang telah diproses (T2), najis kambing yang belum diproses (T3), najis kambing diproses (T4), najis ayam yang belum diproses (T5) dan najis ayam diproses (T6), Setiap rawatan mempunyai lima kali ulangan. Parameter dari segi analisis fizikal pokok akhir (ketinggian pokok (PH), panjang daun (LL), lebar daun (LW), bilangan daun (LN), berat daun (LW), berat batang (SW) dan berat pokok (PW)) dan analisis kimia (gentian protein (CP), gentian kasar (CF), nitrogen (N), fosforus (P) dan kalium (K)) telah dilakukan untuk menentukan baja paling berkesan. Secara amnya, rawatan najis haiwan yang telah diproses menunjukkan prestasi yang lebih baik dalam analisis fizikal berbanding dengan rawatan menggunakan najis haiwan yang belum diproses terutamanya pada T2, T4 dan T6 ($p > 0.05$). Walau bagaimanapun rawatan menggunakan najis haiwan yang tidak diproses menunjukkan keputusan yang lebih baik dalam komposisi nutrien. Dalam kes tertentu, T2 menunjukkan hasil yang terbaik dalam setiap parameter analisis fizikal, (PH, LL, LN, LW, SW dan PL) manakala rawatan menggunakan najis ayam yang tidak diproses, T5 menunjukkan nilai yang rendah dalam kesemua parameter. Bagi nilai nutrien (CP, CF, N, P dan K), rawatan menggunakan najis ayam yang diproses, T6 menunjukkan hasil yang terbaik dalam semua parameter analisa nutrien. Di antara semua rawatan, najis lembu yang diproses (T2), mempunyai kandungan nutrien yang tinggi dengan kadar penyerapan terbaik pada Napier. Walaupun tahi ayam mempunyai yang gentian protein tinggi dan gentian kasar yang rendah, ia masih tidak digalakkan untuk menggunakan tahi ayam kerana ia mempunyai pertumbuhan Napier yang tidak dijanjikan.

Kesimpulannya, rawatan menggunakan najis haiwan yang diproses harus dipraktikkan kerana ia boleh meningkatkan kualiti Napier, kandungan kelembapan dalam media penanaman dan ketersediaan nutrient yang lebih tinggi untuk pokok Napier. Walau bagaimanapun, pemotongan yang lebih kerap dan pengurusan yang lebih baik perlu dilakukan dengan menggunakan baja organik untuk keputusan dan pelaksanaan yang lebih baik.

CHAPTER 1

INTRODUCTION

The demand of animal products increases the establishment of many livestock farms around the world including Malaysia. These increase in number of farms increase the waste productions thus can contribute to many environmental and ethical problems. According to Tabung Alam Malaysia, 2.3 million tonnes of livestock waste (Lim, 1992). The huge amount of livestock waste can contribute to many problems and the increase of farm establishments subsequently increases the livestock waste production. Scientist keep on searching and experimenting these waste and many projects was conducted to reduce the problems related to this area. According to National Resources Defence Council (NRDC), pollution from livestock farms can contribute threats to both human and environment. Gasses, water contamination and accumulation of heavy metals all comes from tonnes of livestock wastes carries unbelievable threats thus causes more researches to be conducted.

Intensive and non-intensive livestock farming system both contribute to waste production. The priority for economical side left out one of an important thing that is pollution due to livestock waste. Recently, many research and projects were done to utilize this much livestock products to be a beneficial materials that can be used other than leaving them to pollute the environment. Such utilization would help to maximize available resources and minimize waste disposal problems. Livestock manure was produced in large quantities as one of that livestock waste could be utilized.

Livestock manures consist of solid farm yard manure and slurry farm manure (liquid form) contains organic composition that later could be used as fertilizer. Manure improve soil fertility and structure by adding organic matter and improves aggregation of soil. It also can encourages soil microbial activity by promoting soil's trace mineral supply. Presence of ammonia, phosphorus and potassium in livestock manures can help in providing nutrients crop plantations.

There have been a number of studies have been conducted on the manure utilization as fertilizer. In the past year, many journals and papers had been published to describe the manure nutrient composition and the utilization and its beneficial nutrients on Napier plantation but study on the absorption of manure nutrients by Napier plants in different manure size and conditions never been conducted. This study highlights on the comparison of nutrient absorption of Napier grass applied as raw or unprocessed of different types of animal manure.

Specifically, the objectives of this study are to investigate the effect of different types of animal manures on Napier growth and to evaluate the utilization of nutrient by Napier plant given different types of manure and different manure condition, unprocessed and processed.

1.1 Research Hypothesis

It is believed that different types of animal manures will affect the growth performance of *Pennisetum purpureum* based on the plant height and nutritive value of the pasture. It is also believed that processed animal manures will gives better nutrient absorption, thus gives a better growth performance on *Pennisetum purpureum* growth compared to unprocessed animal manures.

1.2 Objectives

1.2.1 To investigate the effect of different sources of animal manures on *Pennisetum purpureum* growth performance.

1.2.2 To compare the effect of different types (unprocessed and processed) animal manures on *Pennisetum purpureum* growth performance.

1.3 Significant of Study

Farmers do not take seriously in controlling their animals' manure. Easy steps taken by removing these impurities into the pit or nearby waterways without realizing manures capable to reduce the costs of animal feed and increase their profit.

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