UNIVERSITI PUTRA MALAYSIA

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WEED SPECIES PREFERENCES BY KATJANG GOATS IN OIL PALM PLANTATION

BY

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A project report submitted to Faculty of Agriculture, Universiti Putra Malaysia, in fulfilment of the requirement of SHW 4999(Final Year Project) for the award of the degree of Bachelor of Agriculture (Animal Science)

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CERTIFICATION

This project entitled **weed species preferences by Katjang goats in oil palm plantation** was prepared by Nurul Syahirah Zaki and submitted to the Faculty of Agriculture in fulfilment of the requirement of SHW 4999(Final Year Project) for the award of the degree of Bachelor of Agriculture (Animal Science).

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ABSTRACT

Goats possess characteristics including versatility in grazing adverse plant species and the ability to survive under different foraging condition which put them apart from other livestock animals. Three female Katjang were used pastured under the plantation that contain variety of weed species. The objective is to establish the weed species preferences by goats in oil palm plantation. Specifically, the weeds preferences were determined by the reference of individual animal and grazing day. The weight gain of the goats were also recorded every week to show the progress of the goats. Grazing behavioral data that included number of bites and time spend on each weed species were recorded using the direct observation method and the measurements were performed every day for 28 days of period. According to the result, broadleaved weeds and grasses were the most selected by the goats. In the final analysis, *Asystasia intrusa* was the most preferred weeds species and shows that it was the most important part of the diet of goats in such ecosystem. In contrary, *Ishaemum musticum* was the last preferred based on the top 5 rankings could be largely explained by the fact that goats are naturally browsers.

KEYWORDS: Preferences, Weeds, *Asystasia intrusa,* Individual animal, Grazing day

ABSTRAK

Kambing mempunyai ciri-ciri yang tersendiri seperti kebolehan dalam meragut pelbagai jenis tumbuhan serta keupayaan untuk hidup dalam keadaan meragut yang berbeza di mana secara tidak langsung meletakkan kambing di posisi yang agak berlainan berbanding dengah haiwan ternakan yang lain. Tiga kambing Katjang betina digunakan dalam kawasan tanaman kelapa sawit yang terdapat pelbagai jenis spesies rumpai. Objektif kajian ini adalah untuk mewujudkan pilihan spesies rumpai oleh kambing dalam kawasan tanaman kelapa sawit. Untuk lebih spesifik, pilihan rumpai telah ditentukan melalui pemerhatian oleh setiap haiwan individu dan juga hari meragut. Data kelakuan meragut termasuklah kekerapan gigitan dan masa yang diambil untuk meragut bagi setiap spesies rumpai telah direkod menggunakan kaedah pemerhatian secara langsung and segala rekod data diambil setiap hari selama 28 hari. Berdasarkan dapatan penyelidikan, kambing lebih memilih untuk meragut jenis rumpai yang berdaun lebar serta rumput. Dalam analisis akhir, Asystasia intrusa merupakan spesies rumpai yang paling digemari oleh kambing dan ini menunjukkan bahawa rumpai tersebut memainkan peranan penting dalam pemakanan kambing di bawah ekosistem tersebut. Walaupun begitu, Ishaemum musticum pula merupakan spesies rumpai yang paling kurang digemari dan ini menerangkan fakta bahawasanya kambing merupakan pemakan daun secara semula jadi.

KATA KUNCI: *Pilihan, Rumpai, Asystasia intrusa, Haiwan individual, Hari meragut*

CHAPTER 1

INTRODUCTION

Research background

1.1 Oil Palm Plantation

Oil palm and rubber are two significant estates in Malaysia. They cover an expected region of more than 4 million hectares. Palm oil is produced on large industrial plantations in Malaysia and Indonesia. Oil palm covered more than 12 million ha in the world in 2007, a 50% increase over the past 10 years, with Malaysia having 41% and Indonesia 44% of the total (MADI, 2009/2010). Oil palm planted area in 2015 reached 5.64 million hectares, an increase of 4.6% as against 5.39 million hectares recorded in the previous year. This was mainly due to the increase in new planted areas especially in Sarawak, which recorded an increase of 13.9%. Sabah is still the largest oil palm planted state, with 1.54 million hectares or 27% of the total oil palm planted area, followed by Sarawak with 1.44 million hectares or 26%, while Peninsular Malaysia accounted for 2.66 million hectares or 47% (MPOB, 2012).

The inter row areas of these crops are usually covered with vegetation consisting of leguminous cover crops, grasses, broadleaf species and ferns which forms a naturalized pasture and can be utilized as forages for livestock production. There are about 60 to 70 plant species growing under the young plantation crops and the number declines to 20 to 30 species under older trees. 70% of these species are palatable and can contribute as forage

for livestock production (Chen *et al*., 1978; Wan Mohammad 1978; Hassan and Abdullah, 1991). These inter-row plant species found in all oil palm plantations are usually considered as weeds. If these forages are poorly managed, it may affect the growth of the main plantation crop especially those that are still early in ages. Oil palm yields in Malaysia are jeopardized by the presence of weeds.

1.2 Weeds

Weeds are defined as any plant which grows at undesirable place and time. For most part, these plants are known more for the undesirability qualities rather than for their good ones, should there be any. These plants are very competitive to other grasses and they are fighting for light, water, space and nutrients.

In oil palm production system, weeds are known to be the major component. Weeds can be categorized into a mixture of grasses, sedges, and broadleaves. However, weeds are said to be consistently depressed the performance of oil palm and this depressive effect was attributed to aggressive growth resources and repressing of the oil palm (Chung et al., 2013). There are a number of weed control methods such as cultural, mechanical, chemical (herbicides), and integrated production system of using livestock animals to control the weeds. To control weed efficiently, the usual practice that is being applied is by the use of herbicide. This practice is known as chemical control herbicide. Herbicide can prevent or suppress weed growth. However, the handling must be appropriate to ensure satisfied plant suppression so that all undesirable weed can be destroyed. This practice also requires different costs such as chemicals, equipment, labor and time.

For a better and safer way of weed management, grazing livestock are being used to control the weeds. Furthermore, there are other costs that can be reduced as well to a bearable level if enterprises are combined together; such as livestock production under oil palm which will increase intensity of land use or land use maximization, reduction in cost of oil palm maintenance and above all ensuring higher returns for both the joint oil palm and livestock enterprises (Latif and Mamat, 2002).

1.3 Grazing Behaviour

Grazing animals can be released under the plantation crops for more efficient resource utilization and at the same time, helps in controlling weeds. This system is also known as integrated or "land-sharing livestock-production system. Those of palatable species will be accepted or grazed by the livestock animals. In the grazing situation, livestock animals such as goats, are known to be very selective grazers. A selective grazer is any animal that is able to target and get a specific plant. Selective grazing involves just what it says, selecting something and then grazing it. They are able to analyze, explore and take the consumable plants and refuse those that cannot be consumed on and also manage to graze according to nutritional needs, palatability and ease.

Goats have also evolved a narrower muzzle compared to sheep and this allows them to nibble the nutritious young shoots and leaves of prickly bushes and to strip the bark from some stems. In this way goats are able to survive better in arid areas where sheep are not as well adapted. The narrower muzzle may place goats at a disadvantage when only very short pasture is available. By comparison, cattle are less selective partly because they have

a wide mouth (McGregor, 2000). It has been shown that goats can distinguish between bitter, sweet; salty and sour tastes and those goats have higher tolerance for bitter tastes than cattle (Indian Livestock Farm, 2012). If we put the goats in a controlled grazing, we can observe the grazing behavior because it slows the dominance of less desirable, less nutritious plants because goats are forced to consume all plants before moving on. Thus, we are able to list out the ranking of plant species preferences by the goats. It is therefore, important to establish local food habits to ensure easier management on the inter row crops in oil palm plantations and at the same time, to fully utilize particular range types.

1.4 Research Problem

Weeds species identified are mostly a major problem in oil palms plantations and thus by releasing animal grazing underneath the plantation, the growth of weeds can be reduced. Goats are known to be very selective grazers and this allows them to choose more palatable plant species and allows them to get the nutrients they need while avoiding poisoning from toxic plant. Why an animal prefers one plant and not another is still a puzzle.

1.5 Research Hypothesis

The choices of forages vary widely and seems to depend on availability.

Aim of The Study

General objective: The main purpose of this study was to determine the weeds species preferences by Katjang goats in oil palm plantation.

Specific objectives:

1. To find out the types of weeds available in oil palm plantation
2. To determine the weeds preferences by reference of individual animal and grazing day
3. To observe the progression of the goats by recording weekly weight gain

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