

# Odor Grass (*Pennisetum purpureum* cv Mott) Productivity at Planting Distances and Different Defoliation Age

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## ABSTRACT

The research aimed to analyze the production of fresh and dry ingredients of odor (*Pennisetum purpureum* cv Mott) grass at different planting distances and defoliation ages. The research was conducted in two places, namely the Field Laboratory and the Laboratory of Nutrition and Feed Analysis of the Faculty of Animal Husbandry Halu Oleo University, Kendari. The research used a factorial design. Distances consisted of three levels: 60 x 90 cm, 75 x 90 cm, and 90 x 90 cm while the defoliation ages consisted of 3 levels: 60 days after sowing (DAS), 90 DAS and 120 DAS. The results of the research showed that highest average production fresh matter of odor grass was obtained in the combination of planting distance treatment of 60cm x 90cm and defoliation age of 120 DAS (22.11 tons/ha) which was actually higher than the average production of fresh matter odor grass in the combination of planting distance treatment of 90cm x 90cm and defoliation age of 60 DAS (9.1 tons / ha). The conclusion is that the interaction of planting distance treatment and cutting age indicates the production of fresh matter odor grass 13.51 tons/ha.

**Keywords:** Odor grass, Fresh matter, Dry matter.

## 1. INTRODUCTION

Odor grass is forage of very quality animal feed. This grass is very easy to breed in various land conditions, suitable for use for cut grass garden areas, resistant to shade, and easy to grow back after defoliation. High enough production of odor grass becomes its advantage. Odor grass is preferred by cattle and goats especially in the rainy season, it stems feel softer. Odor grass has a fairly high nutrient content. The crude protein in odor grass leaves reaches 12-17%. In the rainy season, the interval of defoliation life between 30-40 days the number of sapouts reaches 20.

Planting distance arrangement is very important in cultivating forage animal feed, enabling more optimal forage productivity so that the availability of feed both in terms of quality and quantity can be met and available throughout the year. Planting distance affects the high yield of plants. Odor grass production varies greatly and is influenced by various factors, including

agroclimate, planting distance and cultivation management. The age defoliation which is getting older is also very influential on the content of crude protein. The decrease in the crude protein of odor grass is very drastic as we get older.

## 2. MATERIALS AND METHODS

### 2.1 Research Land Preparation

Land preparation was begun by clearing the land from weeds and shrubs. After clearing the land, land demolition was carried out using tractors followed by soil smelting and making beds in accordance with the needs of treatment in this study. Each group consisted of 9 plots measuring 3 x 4 m<sup>2</sup> per plot. Analysis of the soil nutrient content (N, P, K and Al) was performed before the research begins. Another activity performed was to measure the characteristics of the microclimate (humidity and temperature) of the test site.

## 2.2 Planting and Observance

Odot grass planting was carried out using seedlings stem measuring 3-4 segments with planting distance according to treatment. The number of odot grass cuttings planted on each plot was adjusted to the planting distance, which was 25 cuttings, 20 cuttings, 15 cuttings each for planting distance of 60 cm x 90 cm, 75 cm x 90 cm and 90 cm x 90 cm. Weeding or cleaning of weeds was done 3 weeks after planting and then done every month; embroidery was done if the planted seedlings did not grow. The test was done in the first and second weeks.

## 2.3 Measurement of Forage Production

Measurements of odot grass forage production on each treatment plot were done by cutting the entire clump that grew on each treatment plot at different defoliation ages 60 days after sowing (DAS), 90 days after sowing (DAS), and 120 days after sowing (DAS). After defoliation of the grass, weighing was done to find out the fresh forage material of the odot grass every patch of treatment. Sampling of odot grass as much as 10% of the total forage production in each treatment was done by first chopping and then putting into a sample bag that had been prepared. Samples that had been collected were first dried in a 60°C oven and weighed in weight to find out the initial dry matter and then stored for further stage research needs.

## 2.4 Research Parameters

The first experimental parameter consisted of the production of fresh matter and the production of dry matter (tons/ha).

Production of fresh matter (tons/ha). Fresh weight was done by weighing the defoliation odot grass on each plot. Crop defoliation was done at the time of plant age 60 DAS, 90 DAS and 120 DAS.

Production of dry matter (tons/ha). Dry weight production was measured by weighing the experimental sample that had been put in a 105°C, after which, the sample was cooled until a stable weight and then weighed

## 3. RESULTS AND DISCUSSION

### 3.1 Production of Fresh Matter

Average summary of the production of fresh matter odot grass obtained in this research is presented in Table 1.

The results of the ANOVA show that the interaction of planting distance treatment and defoliation age have no significant effect ( $P > 0.05$ ) on the production of fresh matter odot grass. The treatment of the age defoliation is

significant and planting distance independently has a very real effect ( $P < 0.05$ ) on the production of fresh matter odot grass. Data in Table 1 show that the highest average production of fresh matter odot grass is obtained in the combination of 60cm x 90cm planting distance treatment and a marked 120 DAS (22.11 tons/ha) defoliation age which is higher than the average production of fresh matter odot grass at the combination of 90cm x 90cm planting distance treatment and 60 DAS (9.1 tons/ha) defoliation age. Furthermore, in the treatment of planting distance, the highest average production of fresh matter odot grass is obtained at the treatment of planting distance of 60cm x 90cm (18.51 tons/ha), which differs very noticeably ( $P < 0.01$ ) from the production of fresh matter odot grass at the treatment of planting distance of 75cm x 90cm (14.29 tons/ha), and planting distance of 90cm x 90cm (11.49 tons/ha). The production of fresh matter odot grass at the treatment of 75cm x 90cm (14.29 tons/ha) planting distances is also noticeable higher ( $P < 0.05$ ) compared to the 90cm x 90cm (11.49 tons/ha) planting distance treatment. Similarly, the defoliation age treatment of 120 DAS produces the highest production of fresh matter odot grass which is 17.83 tons/ha which is different from the production of fresh matter odot grass at the defoliation age treatment of 60 DAS (12.83 tons/ha) and 90 DAS (13.56 tons/ha). However, there is no real difference in the production of fresh material odot grass at the treatment of defoliation age of 60 DAS and 90 DAS.

Table 1 show that the higher the defoliation age, the higher the production of fresh matter odot grass. Similarly, the treatment of planting distance shows that the higher the size of the planting distance, the lower the production of fresh matter odot grass. The average production of fresh matter odot grass in this research varies greatly depending on soil fertility, agroclimat and season of each place as well as the interval and age defoliation. The average fresh matter production odot grass obtained in this research ages 60 DAP planting distance of 60 cm x 90 cm is 12.86 tons/ha. Fresh matter production is lower than the results of Kusdiana *et al.* [1] research, which is 36.125 tons/ha at planting distance of 60 cm x 60 cm. While Prasetyo [2] reported that the fresh production of odot grass at a planting distance of 30 x 30 cm at a cutting age of 60 days is 5.7 tons/ha.

Planting distance affects the production of fresh matter odot grass. This is because the number of plants per unit area is more at a narrow planting distance than the wide. Planting distance of 60 cm x 90 cm can be planted by odot grass as much as 25 defoliations per trial plot (12m<sup>2</sup>), while planting distance of 75cm x 90 cm can only be planted by 20 defoliations and planting distance of 90cm x 90cm can be planted by 15 defoliations of odot grass. Based on these data, it can be said that the rate of absorption of nutrients and water

**Table 1.** Production of fresh matter (tons/ha) odot grass at different plant distances and defoliation age

Planting Distance (cm)	Defoliation Ages			Average±SD
	60 DAS	90 DAS	120 DAS	
	..... tons/ha. ....			
60 x 90	16.96	16.46	22.11	18.51±3.13 <sup>x</sup>
75 x 90	12.52	14.03	16.20	14.29±1.85 <sup>y</sup>
90 x 90	9.10	10.18	15.19	11.49±3.25 <sup>z</sup>
Average±SD	12.86±3.94 <sup>b</sup>	13.56±3.17 <sup>b</sup>	17.83±3.74 <sup>a</sup>	13.51±4.58

Description: The numbers followed by different letters<sup>abxyz</sup> in the same row/column show significant difference at a 95% confidence level

**Table 2.** Production of dry matter (tons/ha) odot grass at different planting distances and defoliation age

Planting Distance (cm)	Defoliation Age			Average±SD
	60 DAS	90 DAS	120 DAS	
	..... ton/ha. ....			
60 x 90	17.7	19.9	26.7	21.5±0.47 <sup>x</sup>
75 x 90	12.9	16.2	20.7	16.6±0.39 <sup>y</sup>
90 x 90	11.7	12.8	21.8	15.4±0.56 <sup>y</sup>
Average±SD	14.1±0.32 <sup>b</sup>	16.3±0.36 <sup>b</sup>	23.1±0.32 <sup>a</sup>	17.8±0.50

Description: The numbers followed by different letters<sup>abxyz</sup> in the same row/column show significant difference at a 95% confidence level.

absorption and exposure to light planting distance still have the same effect on the growth of odot grass at various planting distances, so the difference in production is greater due to planting distance factors. Manauw [3] states that wet weight of plants can indicate the metabolic activity of plants and wet weight of plants is affected by the water content of tissues, nutrients and metabolic results.

The age of crop defoliation affects the rate of productivity of plants, with an increase in the number of leaves and the number of saplings will increase the amount of fresh weight gained [4]. Planting distance affects the production of fresh weight of odot grass because plant production is affected by nutrients in the soil. The production of fresh grass matter is influenced by the high increase and the number of saplings produced [5]. While Istikomah and Kunharjanti [6] states the planting distance affects the high yield of the plant, so the high low crop yields affect production in one acreage. The increase in production begins with increase yield per unit area, then after the maximum point is reached result will be decrease. It is suspected that planting distance affects the availability of nutrients for plants that are play a role in the process of plant growth and development so that it will also It affects the fresh weight of the plant [6].

**3.2 Dry Matter Production**

The average production dry matter of odot grass obtained in this research is presented in Table 2.

The results of the ANOVA show that the treatment of planting distances and the defoliation age is significant (P<0.05) on the production of dry matter odot grass, but the interaction between treatments does not have a real influence (P>0.05) on the production of dry matter odot grass in this research. Duncan's test results show that the average production of odot grass dry matter at 60cm x 90cm (21.5 tons/ha) dry matter is markedly higher than the production of odot grass dry matter at 75cm x 90cm (16.6 tons/ha) planting distance treatment and 90cm x 90cm (15.4 tons/ha) planting distance treatment.

The production of dry matter odot grass at a planting distance of 60 cm x 90 cm is higher than the production of dry matter at planting distance of 90 cm x 90 cm. The production of dry matter at the defoliation age of 120 DAP is higher than the production of dry matter odot grass at the defoliation age of 60 DAS and 90 DAS. The production of dry matter odot grass varies greatly depending on soil fertility, local climatic conditions, and season. As reported by Tekletsadik *et al.* [7] that the production of dry matter odot grass varies greatly for each region depending on local land and agroclimat conditions.

The average production of dry matter odot grass in this research conducted before entering the dry season is 17.8 tons/ha. The results of this research are higher than the production of dry matter odot grass in Thailand the dry season of 18.44 tons/ha and the same results of research by Rengsirikul *et al.* [8] who report that the production of dry matter odot grass in the dry season is

17.8 tons/ha. In Pakistan, production of dry matter odot grass without fertilizer is 24.22 tons/ha with the amount of dry matter production in the dry season is 21.4 ton/ha [9] [8].

#### 4. CONCLUSION

Based on the results and discussions on the productivity of odot grass, the conclusion is that the interaction of planting distance treatment and defoliation age indicates the production of fresh matter odot grass 13.51 tons/ha, while the production of dry matter 17.8 tons/ha. The highest production of fresh and dry matter at a defoliation age of 120 DAS is 17.83 tons/ha and 23.1 tons/ha, respectively. The highest production of fresh and dry matter at a planting distance of 60 cm x 90 cm is 18.51 tons/ha and 21.5 tons/ha, respectively.

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