

Use Of Different Planting Media To The Content Of Organic Matter, Ash, And Crude Protein From Hydroponic Corn Fodder

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ABSTRACT

Fodder is a plant that is given to livestock to meet the nutrients needed by livestock, its feeding can be fresh or dried forage, grain or tuber form, and in silage form. This study aims to determine the influence of hydroponic planting media on the content of organic matter, ash and crude protein of corn fodder. The method used was a complete randomized design (CRD) with differences in planting media as a treatment, the research treatment included P0= plain water, P1 = rice-washing water, P2 = soybean soaking water, and P3 = tofu wastewater, each treatment is repeated 5 times. Parameters in this study were the content of organic matter, ash, and crude protein. The statistical analysis used was ANOVA at the level of 5%. If there is a discrepancy, continue with the Duncan Multiple Range Test (DMRT) test. The results showed that the difference in the use of planting media did not give a real effect ($P>0.05$) on the content of organic matter and ash, but a real effect ($P<0.05$) on the crude protein content of corn fodder hydroponic.

Keywords: corn fodder, washing water of rice, soybean soaking water, tofu wastewater

INTRODUCTION

Indonesia is a tropical country that has two seasons, dry season and rainy season. The change of season will determines the availability of forages for livestock. The availability of forage is very abundant during the rainy season, but in the dry season the availability of forage decreases drastically. The need of forage for livestock will continue to increase along with the increasing number of livestock due to the increasing demand for livestock. Alternatives are needed that can be a solution in meeting the needs of animal feed forage which is not affected by the season. The effort carried out by planting forage through hydroponic fodder.

Hydroponics is the activity of growing crops without using soil media but using nutrient-mixed water as the planting medium. Planting using a hydroponic system does not need to pay attention to the season because the

hydroponic system is not affected by the season. The advantages of corn grown with a hydroponic system is, the corn kernels have a short time to growth so it will accelerate production time (Sitorus, 2020).

Fodder needs good nutrition for growth and development. Materials that have the potential to be used as a source of nutrients include rice-washing water, tofu wastewater, and soybean soaking water. Marewa's research (2020), stated that the use of rice-washing water of 300ml/tan has the best influence on the growth and production of eggplant. Based on research by Rahmawati (2014), shows that watering tofu wastewater at 75% concentration has a significant effect on plant height, number of leaves, leaf width, and wet weight of mustard plants. Zuchrotus et al., (2009), mentioned that giving soybean soaking water 60% concentration has a significant effect on increasing the growth of kangkung (*Ipomea reptans* Poir).

This study was conducted to determine the effect of differences in hydroponic planting media on the content of OM (Organic Matter), ash, CP (Crude Protein) corn fodder.

MATERIALS AND METHODS

This study was carried out from March to August 2022 in a green house, Faculty of Agriculture, Universitas Tidar, Magelang City. The study materials used were 2.8 kg of corn kernels, water, rice-washing water, soybean soaking water, and tofu wastewater.

This study used a Completely Randomized Design (CRD) with 4 treatments and 5 repeats. The treatments were: P0 = Watering using water, P1= Watering using rice-washing water, P2= Watering using soybean soaking water, P3= Watering using tofu wastewater. The parameters observed were OM, Ash, CP of hydroponic corn fodder.

RESULT

Based on the results, it shows that the use of various planting media has no significant effect ($P>0.05$) on the content of OM and ash, however giving significant effect ($P<0.05$) on the CP of hydroponic corn fodder.

Table 1. The average content of OM, ash and CP of hydroponic corn fodder.

Parameters (%)	Treatment			
	P0	P1	P2	P3
OM	96,87 ±0,13	96,95± 0,064	96,89 ±0,11	96,69± 0,09
Ash	3,12± 0,13	3,04±0, 06	3,10± 0,11	3,30±0, 09
CP	^b 16,48 ±0,16	^b 16,53± 0,50	^a 14,76 ±0,25	^a 14,95± 0,19

^{ab}The average values in different superscripts in the same column showed significant differences ($P<0.05$). Description: P0 = Watering using water, P1 = Watering using rice-washing water, P2 = Watering using soybean soaking water, P3 = Watering using tofu wastewater

DISCUSSION

Organic Matter (OM)

The Anova analysis of (OM) organic matter of hydroponic corn fodder showed that the planting media had no significant effect on the content of organic matter ($P>0.05$). Organic matter content that is not significantly different due to the nitrogen availability in the growing medium is too low. Nitrogen is needed by plants to stimulate plant growth, this is in accordance with Prihartini (2014) which states that the nitrogen content in fertilizers can increase crop production and number of leaves therefore that organic matter also increases. Research by Akerina et al (2021) stated that the use of various solid organic fertilizers showed that there was no real influence on the number of leaves of corn fodder, this was because corn fodder did not get enough sunlight, so plant cannot growth optimally and the treatment given did not have an influence on the number of leaves of corn fodder.

In this study, it is expected that the nutrients contained in rice-washing water, soybean soaking water, and tofu wastewater have large particles and have not been decomposed so that nutrient particles are difficult to be absorbed by fodder, that based on Dita (2007) statement, which states that if the decomposition process goes slowly, then the amount of nutrients will be small and plant growth will be inhibited.

In addition, the young and newly grown roots of fodder cause non-optimal nutrient absorption. The roots help the absorption of nutrients and water (Syafuddin 2002). Water and nutrients are absorbed by the root tip, the amount of water and nutrients absorbed by the roots will affect the roots development, the lack of water will cause the roots development not optimally, so it will inhibit nutrient absorption by the roots (Sugiyanto, 2008)

Ash

The Anova analysis of ash in hydroponic corn fodder ash values showed that the planting medium had no significant effect on the ash content ($P>0.05$). There is no real influence on the ash content because the planting media does not meet the water needs of corn fodder. This is in accordance with the Khalili's et al., (2011), who state that ash levels will decrease significantly if feed crops experience heat stress. Zhao et al., (2009) mentioned that the mineral or ash content is strongly influenced by water, while the water is sufficient dissolved carbohydrates will decrease and increasing the mineral concentration, on the contrary if lack of water happen, the content of dissolved carbohydrates will increase and the minerals concentration will decreases.

The ash content in a feed crop is closely related to the harvest age of the feed crop. The older the feed plants harvested, the more inorganic matter content in the feed plants will increase (Aulia et al., 2017). In this study, corn fodder was harvested at a young age, so that the ash content in corn fodder was low.

Crude Protein

The Anova result to the crude protein values of hydroponic corn fodder showed that the planting media had a significant effect on the crude protein (CP) content ($P<0.05$). The highest crude protein content is produced from watering (P1) using rice-washing water 16.53% and (P0) water 16.48%. This value is significantly different from the crude protein content of fodder by watering using soybean soaking water (P2) 14.76% and tofu wastewater (P3) 14.95%. The difference in crude protein content in hydroponic corn fodder is caused by nitrogenous elements absorbed by plants as a source of nutrients for growth.

There is no difference between watering using rice-washing water (P1) and watering using water (P0) because the nitrogen in the watering medium cannot be absorbed properly by corn fodder. Nitrogen that is not

absorbed properly in corn fodder causes the crude protein content not to different between treatments, low nitrogen doses in the watering medium result in nutrients not being absorbed optimally by corn fodder, this is in accordance with the Rizqiani's et al. (2006), who stated that plants really need nutrients in the metabolic process, especially in the vegetative period.

The pH content of each treatment followed by the pH of rice-washing water 6.68 (Dewi et al, 2021), tofu wastewater 4-5 (Wagiman and Suryandono, 2004), and soybean soaking water 4.16 (Wiryani, 2007). The low content of crude protein in the treatment of P2 (soybean soaking water) and P3 (tofu wastewater) is caused by pH value was too low. This is in accordance with the statement of Sotyohadi et al., (2020), who stated that the pH level of hydroponic planting media that is too low will cause fungi to grow and roots will rot, so that nutrient absorption will be disturbed.

CONCLUSION

The use of rice-washing water, soybean soaking water, and tofu wastewater as a hydroponic corn fodder planting medium did not have a significant effect on the content of organic matter (OM) and ash, but had a significant effect on the crude protein (CP) content of corn fodder.

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