The Responses of Some Doses Fertilizer Bat Guano on The Crop Yield of Hiyung Chili Pepper in the Ultisols

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Hiyung chili is a type of chili found in Hiyung Village, Tapin District, South Kalimantan with a spiciness rate of 94.500 ppm. Bat manure is a fertilizer that contains elements of N, P, and K which are important for plant growth and development and are expected to increase nutrient content in the soil. This study aims to determine the effect and the best dosage of bat manure on the growth and yield of Hiyung chili on ultisol. Ultisol is a soil with low organic matter, yellowish-red soil, acid soil reaction, low base saturation, high Al content, low nutrient content such as N, P, and K. This study used a single factor CRD consisting of 5 treatment levels, name k0 = 0 t/ha, k1 = 1 t/ha, k2 = 2 t/ha, k3 = 3 t/ha, k4 = 4 t/ha. The result showed that fertilizer bat droppings able to increase the height of plants on plants chili pepper hiyung (Figure 1). The addition of higher plants also affected the nitrogen in the nitrogen fertilizer 

1. Introduction

One of the varieties chilies potentially cultivated and is local variety South Kalimantan is Chili Pepper Hiyung. Chili Pepper Hiyung is a kind of pepper can be found in the village huyung district Tapin South Kalimantan with a pungency rate 94.500 ppm (BPS Kabupaten Tapin, 2016). Chili pepper huyung have permission varieties name 09/pv/2012 since 12 April 2012 through the center of protection varieties of a plant and licensing agricultural The Agriculture Ministry of the Republic of Indonesia. Organic fertilizers that can be used in plants and fertilizer diert manure. Improvements in production and quality can be achieved through the action of cultivation as fertilizing, especially nitrogen, phosphorus, and potassium that is it is the macro disturbances. Bat fertilizer having the N 8.32 %, P 2.06%, and K 0.54% with C/N the ratio of 3 with the organic matter C-organic and each 21.94 % and 37.95 %. High nitrogen, C-organic phosphor from bat manure having a low ratio of C / N and relatively K (Simanungkalit et al., 2010). As sub-optimal land having lacking variety, ultisol soil has the ability are insufficient in the development of agricultural commodities in dry fields. Hence, ultisol soil needs to be done management-intensive to be able to be used as a room growing plants (Mulyani & Suhardjo, 1994), especially of chili huyung. This study aims to determine the effect and the best dosage of bat manure on the growth and yield of Hiyung chili on ultisols.

2. Material and Methods

The study was done in the greenhouse experiments at Agroecotechnology of Agricultural Faculty, Lambung Mangkurat University, Banjarmbaru. Began in September until December of 2018. The material used in this study is the seed of Hiyung chili on ultisol. Ultisol is a soil that has low organic matter, yellowish-red soil, acid soil reaction, low base saturation, high Al content, low nutrient content such as N, P, and K. This study used a single factor CRD consisting of 5 treatment levels, name k0 = 0 t/ha, k1 = 1 t/ha, k2 = 2 t/ha, k3 = 3 t/ha, k4 = 4 t/ha. The results of this study showed that giving several doses of bat manure fertilizer significantly affected plant growth, leaf size, fresh fruit weight, cropping, and crop production. The best bat manure doses to increase growth and yield of chili plants at a dose of 3 t/ha.

3. Result and Discussion

Increased High of Plant

Based on Figure 1, the fertilizer bat droppings produce no significant difference. On the treatment k0 (0 t/ha-1 without bat guano fertilizer) show no significant difference with treatment k1 (1 t/ha-1 bat guano fertilizer), k2 (2 t/ha-1 bat guano fertilizer), and k3 (3 t/ha-1 bat guano fertilizer), has significant real different with k4 (4 t/ha-1 bat guano fertilizer). That means the addition of height the plants is the best treatment k4 (4 t/ha-1 bat guano fertilizer) with high 52.25 cm in contrast to another dose. While the addition of the height of plants the lowest was on the treatment k1 (1 t/ha-1 bat guano fertilizer) is 28.02 cm.

The result showed that fertilizer bat droppings able to increase the addition of the height of plants on plants chilli pepper huyung (Figure 1). The dose of fertilizer bat droppings 4 t/ha-1 has the highest dose was different real doses 1, 2, 3 t/ha-1, it can be said that a dose of 4 t/ha-1 sufficiently supplied to plant. The results of this study showed that giving several doses of bat manure fertilizer had a real impact on the increase tall plant (Figure 1)

![Figure 1](https://example.com/image1.png)

Note: Bat guano k0 (0 t/ha without bat guano fertilizer), k1 (1 t/ha-1 bat guano fertilizer), k2 (2 t/ha-1 bat guano fertilizer), k4 (4 t/ha-1 bat guano fertilizer).

![Figure 2](https://example.com/image2.png)

Note: Bat guano k0 (0 t/ha without bat guano fertilizer), k1 (1 t/ha-1 bat guano fertilizer), k2 (2 t/ha-1 bat guano fertilizer), k3 (3 t/ha-1 bat guano fertilizer), k4 (4 t/ha-1 bat guano fertilizer).

Figure 2: Add of an average number of leaves (strands) to bat guano with various doses. The line above the bar is the standard error of care. Show that the effect does not differ based on Duncan’s Multiple Range Test (DMRT) at the 5% level.

3.2 The addition of higher plants also affected the nitrogen in the nitrogen fertilizer diet dropping generally required for vegetative phase (the plant leaves, stems, and roots) (Setiadi, 2011).

Number of Leaves

Based on Figure 2, shows that treatments give fertilizer bat droppings product markedly dissimilar. Which in treatment k0 (0 t/ha-1 without bat guano fertilizer) shows that markedly dissimilar but k1 (1 t/ha-1 bat guano fertilizer), k2 (2 t/ha-1 bat guano fertilizer), k3 (3 t/ha-1 bat guano fertilizer) with k4 (4 t/ha-1 bat guano fertilizer). This Research showed that fertilizer bat droppings could increase the number of leaves of plants, chili pepper huyung (Figure 2).

The results of the analysis variety showed that the fertilizer bat droppings had a real impact on several leaves plants chili huyung.
Fertilizer doses bat dropping 2 t.ha⁻¹ with the value of 106.25 strands plant have influence highest doses of plant but were different doses for with 1, 3, and 4 t.ha⁻¹ it can be said that doses 2 t.ha⁻¹ sufficiently supplied for the number of leaves of plants. Leave is a place that especial of process of photosynthesis to yield photosynthesize. In the generative leaves deeply aiding in the formation of flowers and fruit, the vegetative plants, especially of leaves affected by the increased availability of some element of organic, especially; N, P, K, Cu, S, and Mg (Prawiranata et al., 1995).

**Heavy Fresh Fruit Plants**

The Application fertilizer dirt bat had a real impact on heavy fresh fruit based on the results of the analysis variety of (Figure 3).

![Figure 3](image)

**Note** : Bat guano k₁ (0 t.ha⁻¹ without bat guano fertilizer), k₂ (1 t.ha⁻¹ bat guano fertilizer), k₃ (2 t.ha⁻¹ bat guano fertilizer), k₄ (3 t.ha⁻¹ bat guano fertilizer) and k₅ (4 t.ha⁻¹ bat guano fertilizer).

Figure 3: Addition of average Heavy fresh fruit plants(gram) to bat guano with various doses. The line above the bar is the standard error of care. Show that the effect does not differ based on Duncan’s Multiple Range Test (DMRT) at the 5% level.

The Figure 3 shows the fertilizer treatment the bat to exert an influence upon a fresh fruit chili pepper hyang plant. The analysis of heavy plant of fresh fruit at harvest the first and fifth various doses of fertilizer the bat that can be seen in figure 3 based on these results (3). The result showed that fertilizer bat dropping for the fresh fruit could elevate a weight in plants chili paper hiyung 165 g/plant based on the results of the analysis variety of (Figure 3). In treatment doses, k₂ treatment makes a real value of 176.5 g/plant but not unlike k₁ treatment to the value of 165 g/plant but there is a significant difference in treatment k₅ with the value of 125 g/plant and no significant difference with real other treatment.

**The Crop Production Of Chili Pepper Hiyung**

The Application fertilizer dirt bat had a real impact on the crop production of chili pepper hyang based on the results of the analysis variety of (Figure 4).

![Figure 4](image)

**Note** : Bat guano k₁ (0 t.ha⁻¹ without bat guano fertilizer), k₂ (1 t.ha⁻¹ bat guano fertilizer), k₃ (2 t.ha⁻¹ bat guano fertilizer), k₄ (3 t.ha⁻¹ bat guano fertilizer) and k₅ (4 t.ha⁻¹ bat guano fertilizer).

Figure 4: Addition of average the crop production of chili pepper hyang(gram) to bat guano with various doses. The line above the bar is the standard error of care. Show that the effect does not differ based on Duncan’s Multiple Range Test (DMRT) at the 5% level.

Figure 4, seen that the provision of treatment fertilizer bat droppings real bearing on crop production chili pepper hyang. The analysis of the production of chili pepper hyang crop yield from granting a variety of doses of fertilizer bat droppings is presented in Figure 4. Production t.ha⁻¹ suggests that fertilizer bat droppings able to increase the production of t.Ha⁻¹ which yield heavy fresh fruit plants have been converted into a unit of t.Ha⁻¹ chili pepper hyang. In treatment doses, k₁ influence with a real value of 5.88 t.Ha⁻¹ but not markedly dissimilar but k₂ with the value of 5.50 t.Ha⁻¹ but distinct but k₅ with my value as much as 4.17 t.Ha⁻¹ but not markedly dissimilar with other treatment. This is because productivity formed influenced by the womb nutrients P and K, it was reflected from flowers and fruit formed of elements nutrients P, on a stalk fruit in the development of the tissue amplifier to reduce the law of equality fruit caused by either K enough for the plant (Lingga & Marsono, 2008). The production would be found by the rate of photosynthesis and water because the availability of the disturbances, during the local use of reproductive become so strong in the uses of the photosynthesis and limit the vegetative growth for the assimilation, it was.

**References**


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