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

Ayu Fitriani1, Akhmad Rizalbi2, Riza adrianoor Saputra2, Noor Komala Sari2

1 Jurusan Agroekoteknologi, Fakultas Pertanian, Universitas Lambung Mangkurat, Banjarbaru, Kalimantan Selatan, Indonesia, email: ayuf644@gmail.com
2 Jurusan Agroekoteknologi, Fakultas Pertanian, Universitas Lambung Mangkurat, Banjarbaru, Kalimantan Selatan, Indonesia, email: ras@ulm.ac.id
3 Jurusan Agroekoteknologi, Fakultas Pertanian, Universitas Lambung Mangkurat, Banjarbaru, Kalimantan Selatan, Indonesia, email: noorKomala.sari@ulm.ac.id

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Abstrak

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 ultisols.

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 that can be found in the village huyung district Tapin South Kalimantan with the spiciness rate 94.500 ppm (BPS Kabupaten Tapin, 2016). Chili pepper huyung have permission varieties number 09/plv/2012 since 12 April 2012 according to 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 dirt manure. Improvements in production and quality can be achieved through the action of cultivation as fertilizer, 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 (Mulyan & Subardo, 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, Banjarbaru. Began in September until December of 2018. The material used in this study is the seed, chili pepper huyung, bat guano, and ultisol soil. An instrument used in this research is a polybag, sieve, ruler, paper label, analytical balance, water bucket, and stationery. This study uses the randomized complete design by a factor of the bat guano single doses of fertilizer (k) consisting of several tons of standard k0 = 0 t Ha⁻¹ (without fertilizer bat guano), k1 = 1 t Ha⁻¹ bat guano, k2 = 2 t Ha⁻¹ bat guano, k3 = 3 t Ha⁻¹ bat guano, and k4 = 4 t Ha⁻¹ bat guano. The phase of the research which is a preparation of media planting, weeding, pest control, disease, and the harvesting. Variable observation covering the height plants, the number of leaves, the weight of fresh fruit, and crop production chili pepper huyung. To identify the effects of some doses bat guano do by analysis of variance of variables observation uses Genstat 12th edition. The data collected first undergone by the homogeneity of variable data. If ANOVA indicates the existence of the alloment of some doses dirt bat had had real impact (P ≤ 0.05) on the variables of observation, so data contained by test DMRT (Duncan’s Multiple Range Test) at the P-value 0.05.

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 k1 (4 t Ha⁻¹ bat guano fertilizer) with height 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 chili pepper huyung (Figure 1). The dose of fertilizer bat droppings 4 t Ha⁻¹ has the highest dose was different real doses 1, 2, and 3 t Ha⁻¹, it can be said that a dose of 4 t Ha⁻¹ sufficiently supplied to plant. Completed the disturbances N, P, K, Ca, Mg, and S. The fertilizer bat had a real impact on the increase total plant (Figure 1).

The addition of higher plants also affected the nitrogen in the nitrogen fertilizer dirt 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 dropping 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 dropping could increase the number of leaves of plants, chili pepper huyung (Figure 2).

The results of the analysis variety showed that the fertilizer dirt bat had 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 especially important of the process of photosynthesis to yield photosynthetic. 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.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 huyang 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 (Figure 3). In treatment \(k_0\) doses make a real value of 176.5 g plant\(^{-1}\) but not unlike \(k_1\) treatment to the value of 165 g plant\(^{-1}\) but there is a significant difference in treatment \(k_0\) with the value of 125 g plant\(^{-1}\) 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 huyang based on the results of the analysis variety of (Figure 4). Figure 4.Addition of average the crop production of chili pepper huyang(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 huyang. The analysis of the production of chili pepper huyang 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 huyang. In treatment doses, \(k_0\) influence with a real value of 5.88 t.Ha\(^{-1}\) not markedly dissimilar but \(k_1\) with the value of 5.50 t.Ha\(^{-1}\) but distinct but \(k_0\) 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.

because the photosynthetic resulting to distribute goes to fruit part to progress within the state (Koswara, 1992).

**4. Conclusion**

The doses of fertilizer bat guano make a very real increase in higher plants, the number of leaves, heavy plant, fresh fruit and crop production in the chili pepper huyang in ultisols. The best doses fertilizer bat dropping increase in higher plants and number of leaves is dosed 4 t.ha\(^{-1}\) bat guano fertilizer (\(k_3\)), with an average addition height plant 52.25 cm, and the number of leaves with an average 135 strands per plants, while doses best fertilizer bat dropping increase crop yield chili pepper huyang of heavy fresh fruit and the production of plants are doses dirt bat 3 t.ha\(^{-1}\) bat guano fertilizer (\(k_0\)) with an average heavy fresh fruit 165 g plant\(^{-1}\) and production with the average 5.50 t.ha\(^{-1}\).

**References**

BPS Kabupaten Tapin. (2016). Kecamatan Tapin Tengah Dalam Angka Tahun 2015. Badan PusatStatistik Kabupaten. Tapin .https://tapinkab.bps.go.id/publication/2016/01/07/e39225513a7f5737b7c4e8fc/kecamatan-tapin-tengah-dalam-angka-tahun-2015.html

Koswara, J. (1992). Pengaruh Dosis dan Waktu Pemberian Pupuk N dan K Terhadap Pertumbuhan dan Produksi Jagung Manis Seleksi Dermaga 2 (SD2). J. II. Pertanian Indonesia, 2(1), 1–6.

Lingga, P., & Marsono. (2008). Petunjuk penggunaan pupuk. Penebar Swadaya. Mulyani, A., & Solardjo, H. (1994). Soil Characteristics at Dry Marginal Land in Jambi Province, Indonesia. Penanganan Lahan Kering Marginal Melalui Pola Usahatani Terpadu. Jambi (Indonesia). 2 Jul 1994.

Prawiranata, W. S., Hairan, S., & Tjondronegoro, P. (1995). Dasar-Dasar Fisiologi Tanaman Jilid II. Gramedia Pustaka Utama.

Setiadi. (2011). Beritanam Cabai di Lahan dan Pot. Penebar Swadaya.

Simanungkalit, R. D. M., Suriadi, D. A., Saraswati, R., Setyorini, D., & Hartatik, W. (2010). Pupuk Organik dan Pupuk Hayati, PT Balai Pustaka.