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EFFECT OF GOAT MANURE PORATION AND NPK PHONSKA FERTILIZER ON THE GROWTH AND YIELD OF CURLY CHILI (*Capsicum annuum* L.)

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ABSTRACT

This study aimed to determine the effect of the best combination of goat manure and Phonska NPK fertilizer on the growth and yield of curly chilli (*Capsicum annuum* L.). The design used was a randomized block design (RBD) consisting of 12 treatment combinations, a: no treatment, b: 0 t/ha + NPK Phonska 500 kg/ha, c: 30 t/ha + NPK Phonska 0 kg/ha, d: portion of 10 t/ha + NPK Phonska 100 kg/ha, e: portion of 10 t/ha + NPK Phonska 300 kg/ha, f: portion of 10 t/ha + NPK Phonska 500 kg/ha, g: portion 20 t/ha + NPK Phonska 100 kg/ha, h: portion 20 t/ha + NPK Phonska 300 kg/ha, i: portion 20 t/ha + NPK Phonska 500 kg/ha, j: portion 30 t/ha + NPK Phonska 100 kg/ha, k: portion 30 t/ha + NPK Phonska 300 kg/ha, l: portion 30 t/ha + NPK Phonska 500 kg/ha and repeated 3 times to obtain 36 treatment combinations. The results showed that the combination of goat manure and NPK Phonska fertilizer had an effect on leaf area, Net Assimilation Rate (LAB), Plant Growth Rate (LTT), Number of Fruits per Plant, Fruit Weight per Plant (g/plant) and Fruit Weight per Plot (kg/plot) In the combined treatment of 20 t/ha goat manure and 100 kg/ha NPK Phonska fertilizer had the best effect on growth and yield of curly chilli (*Capsicum annuum* L.) with a yield of 460.87 g/plant, 5.53 kg/plot or equivalent to 14.75 t/ha.

Keywords: Curly red chili; Goat manure; NPK Phonska

INTRODUCTION

Red chilli (*Capsicum annuum* L.) is one of the most important types of vegetables in Indonesia, both as a commodity consumed domestically and as an export commodity. This plant has a fairly high economic value and is rich in nutrients that are useful for the human body. The role of chilli as a complement to cooking spices cannot be separated from the traditions and culture of Indonesian people's lives, although this product is not a staple food. Saptana et al. (2012), stated that chilli occupies an important position in the food menu, consumed by almost the entire population of Indonesia 4kg/capita/year. Along with the increasing population and the development of various industries that require curly chilli raw materials, the need for curly chilli continues to increase every year. Based on data from the Statistics Agency and the Directorate General of Horticulture (2020), chilii production from 2016 to 2020 continued to increase. In 2016, red chilli production was 1,045,587 tons and in 2020 it was 1,264,190 tons. The average national chilli productivity is in the

range of 8.47 tons/ha to 9.10 tons/ha. Chilli productivity in 2019 at the farmer level varies in each province, ranging from 2.28 tons/ha to 13.09 tons/ha. According to Prayudi et al. (2010), a well-managed chilli harvest will produce a productivity of 23 tons/ha.

The high interest of Indonesian people in consuming chillies has caused an imbalance between the production produced and consumer demand (Zulkarnain, 2013). To meet the increasing need for chillies, increased production needs to be carried out, one of which is through intensification efforts with appropriate cultivation techniques according to the carrying capacity of the agroecosystem. Intensification efforts include balanced fertilization. Fertilization is carried out because not all soils are good for plant growth. Inorganic fertilizers play are important role in spurring increased plant productivity in food crops, horticulture and plantation crops because they can provide nutrients for plants faster with high content (Taniwiryono and Isroi, 2008). However, the provision of inorganic fertilizers that are too high in dosage and given continuously causes soil pollution and lowers soil pH. Therefore, it must be balanced with the application of organic fertilizers.

The use of organic fertilizers can improve the availability of nutrients in the soil. It can also increase the organic matter content of the soil, which functions not only to improve the soil's ability to retain air but also to mobilize or bridge nutrients that are already in the soil so that they can form ion particles that are easily absorbed by plant roots and currently known as "Porasi" fertilizer, which is organic fertilizer using bioactivators such as beneficial microbes contained in M-BIO biological fertilizer. These microbes include Azotobacter sp, Bacillus sp, Lactobacillus sp, and Saccharomyces sp. (Priyadi, 2017). The results of Kahar's (2019) study showed that the provision of goat manure had a significant and very significant effect on the growth and yield variables of cayenne pepper plants with the highest value in the 30 t/ha treatment, both in the observation parameters of plant height, number of leaves, and number of productive branches. Likewise, it significantly affects the observation parameters of the number of fruits per plant, fruit weight per plant, and fruit weight per plot. Applying 20 tons/ha of goat manure provided the best growth and the highest dry corn kernel yield per plot (1.72 kg equivalent to 1.43 t/ha), significantly different from other treatments (Tadjema, 2018). The application of compost fertilizer at a dose of 20 t/ha had a very significant effect on plant height at the age of 20 days after planting and 30 days after planting, the number of leaves at 30 days after planting, and the wet weight per plant, which was 38.33 g/plant (Samini, 2020). Based on the description above, information on the application of goat manure poration with inorganic fertilizers is not yet known to affect the growth and yield of curly chili plants (*Capsicum annuum* L.). Therefore, to produce quality curly chili production by increasing the absorption of plant nutrients and to reduce dependence on the use of inorganic fertilizers, it is necessary to research the effect of a combination of goat manure poration and inorganic fertilizers on the growth and yield of curly chili plants (*Capsicum annuum* L.). In this study, the organic fertilizer (poration) that will be used is goat manure fermented with biological fertilizer (M-BIO), and the inorganic fertilizer that will be used as fertilizer (NPK Phonska).

METHOD

This research was conducted in the Kubang Sarengseng Block, Bengkekan Hamlet, Sukahurip Village, Pangandaran District, Pangandaran Regency, with an altitude of 121 meters above sea level, from May to September 2022. The tools used were hoes, seedling trays, hand sprayer, labels, meters, smart, stakes, large plastic for fermentation, mulch, books, scales, stationery, rulers, and cameras. The materials used for this study were curly chili seeds of the Lembang 1 variety obtained from the Lembang Vegetable Research Institute (Balitsa), compost, biological fertilizer (M-Bio), goat manure, and NPK Phonska inorganic fertilizer. This study was a field experiment with an experimental method using a Randomized Block Design (RAK) consisting of 12 treatments and repeated 3 times. So 36 treatment combinations were obtained. The treatment factors include: A (Control); B (poration 0 tons/ha + NPK Phonska 500 kg/ha); C (poration 30 tons/ha + NPK Phonska 0 kg/ha); D (poration 10 tons/ha + NPK Phonska 100 kg/ha); E (poration 10 tons/ha + NPK Phonska 300 kg/ha); F (poration 10 tons/ha + NPK Phonska 500 kg/ha); G (poration 20 tons/ha + NPK Phonska 100 kg/ha); H (poration 20 tons/ha + NPK Phonska 300 kg/ha); I (poration 20 tons/ha + NPK Phonska 500 kg/ha); J (poration 30 tons/ha + NPK Phonska 100 kg/ha); K (poration 30 tons/ha + NPK Phonska 300 kg/ha); L (poration 30 tons/ha + NPK Phonska 500 kg/ha).

Research Implementation

The implementation of the research includes: making pores, sowing seeds, soil processing, application of treatment, planting, maintenance and harvesting.

Observation Parameters

a. Supporting Observations

During the experiment, supporting observations include rainfall, soil analysis, goat manure analysis, porosity analysis, and plant pests.

b. Main Observations

The main observations include leaf area per plant, leaf area index, net assimilation rate, plant growth rate, number of fruits per plant, fruit weight per plant, fruit weight per plot, and conversion per hectare.

RESULTS and DISCUSSION

Leaf Area per Plant

Based on the results of the statistical analysis above, it shows that the combination treatment of goat manure portion and NPK Phonska fertilizer only has a significant effect on the age of plants 33 DPA in the combination of goat manure poration and NPK Phonska fertilizer 10 t/ha + NPK Phonska 300 kg/ha as in Table 1. This is because organic fertilizers take a long time to decompose and be absorbed by plants. The absorption of nutrients by young plants or the treatment is still not optimal. In addition, the nutrients contained in the soil are lacking, and the soil pH exceeds the soil pH suitable for chili plants. The ideal soil for chili plants contains at least 1.5% organic matter and has a pH between 6.0 and 6.5. Soil pH conditions are critical because they are closely related to the availability of nutrients. If planted in soil with a pH of more than 7, chili plants will show symptoms of chlorosis, namely the plants will be stunted, and the leaves will turn yellow, which is caused by a lack of iron (Fe)

nutrients. On the other hand, if the pH is less than five, plants will also be stunted due to a lack of calcium (Ca) and magnesium (Mg) or aluminum or manganese poisoning (Sumarni, 1996).

Table 1 Effect of Poration Goat Manure and NPK Phonska Fertilizer on Leaf Area at 25 DAP, 29 DAP, 33 DAP, 37 DAP and 41 DAP

Treatment	Leaf Area (cm^2)				
	25 DAP	**29 DAP**	**33 DAP**	**37 DAP**	**41 DAP**
Control	15.64 a	34.55 a	83.07 a	111.82 a	140.94 a
PO 0 tons/ha+PK 500 kg/ha	33.92 a	97.51 a	159.41 e	228.00 a	627.05 a
PO 30 tons/ha+PK 0 kg/ha	38.15 a	76.35 a	151.05 de	235.31 a	393.40 a
PO 10 tons/ha+PK 100 kg/ha	34.95 a	79.80 a	209.68 g	285.14 a	552.21 a
PO 10 tons/ha + PK 300 kg/ha	41.08 a	163.19 a	2 53.57 h	358.74 a	683.97 a
PO 10 tons/ha + PK 500 kg/ha	29.20 a	71.49 a	97.74 ab	187.29 a	310.89 a
PO 20 tons/ha + PK 100 kg/ha	31.24 a	109.45 a	210.45 g	313.05 a	717.54 a
PO 20 tons/ha + PK 300 kg/ha	33.44 a	62.77 a	126.55 bcd	225.26 a	337.34 a
PO 20 tons/ha + PK 500 kg/ha	36.02 a	81.95 a	176.86 f	352.18 a	479.13 a
PO 30 tons/ha + PK 100 kg/ha	30.87 a	83.54 a	114.08 bc	246.54 a	610.25 a
PO 30 tons/ha + PK 300 kg/ha	41.08 a	89.21 a	137.15 cd	272.61 a	487.43 a
PO 30 tons/ha + PK 500 kg/ha	27.00 a	78.77 a	138.71 cde	178.62 a	293.50 a

*** Description**: The average values followed by the same letter in the same column are not significantly different according to Duncan's Multiple Range Test at the 5% level; DAP (Days After Planting); PO (Poration); PK (NPK Phonska).

In addition, the provision of 10 tons/ha of poration + 300 kg/ha of NPK Phonska at the age of 33 DAP is sufficient to meet the availability of nutrients for plants. Nitrogen elements influence the leaf area. Plants absorb the N element through ammonium ions ($NH4^+$) or nitrate ions ($NO3^-$). Nitrogen is essential in forming chlorophyll, protoplasm, proteins, and nucleic acids. Sources of N elements can be obtained from organic materials, soil minerals, or the addition of organic fertilizers. This element plays a vital role in the growth and development of all living tissues. Nitrogen causes an increase in leaf area because available N can produce more protein so that the leaves can grow wider. Lack of N nutrients will disrupt vegetative growth, ultimately affecting the photosynthesis rate per unit area. The reduced rate of photosynthesis will cause the leaves formed to be narrow (Nurhatika, 2018). Lakitan (2012) stated that providing the proper nutrients, both macro and micronutrients, from organic materials will increase growth and vice versa; if the plant's nutrient requirements are reduced, growth will be inhibited.

Leaf Area Indeks

The combination treatment of goat manure poration and NPK Phonska fertilizer did not differ significantly from the Leaf Area Index at various observation age periods (Table 2). This is likely because the leaf area is not always directly proporational to its dry weight due to the overlapping effect in the canopy, so the provision of goat manure poration and NPK Phonska fertilizer did not differ significantly from the Leaf Area Index. Leaves in plants function as a place to manage light energy into energy and food storage in the form of carbohydrates (glucose) in the form of dry matter. Leaves are also where the respiration and transpiration processes take place.

Table 2 Goat Manure and NPK Phonska Fertilizer on Leaf Area Indeks at 25 DAP, 29 DAP, 33 DAP, 37 DAP and 41 DAP

Treatment	Leaf Area Indeks				
	25 DAP	**29 DAP**	**33 DAP**	**37 DAP**	**41 DAP**
Control	0.005 a	0.011 a	0.029 a	0.037 a	0.047 a
PO 0 tons/ha+PK 500 kg/ha	0.011 a	0.032 a	0.050 a	0.073 a	0.207 a
PO 30 tons/ha+PK 0 kg/ha	0.012 a	0.025 a	0.048 a	0.047 a	0.130 a
PO 10 tons/ha+PK 100 kg/ha	0.011 a	0.026 a	0.068 a	0.093 a	0.182 a
PO 10 tons/ha + PK 300 kg/ha	0.013 a	0.054 a	0.075 a	0.119 a	0.226 a
PO 10 tons/ha + PK 500 kg/ha	0.009 a	0.024 a	0.029 a	0.063 a	0.103 a
PO 20 tons/ha + PK 100 kg/ha	0.010 a	0.036 a	0.067 a	0.103 a	0.237 a
PO 20 tons/ha + PK 300 kg/ha	0.011 a	0.021 a	0.039 a	0.073 a	0.111 a
PO 20 tons/ha + PK 500 kg/ha	0.011 a	0.027 a	0.057 a	0.117 a	0.158 a
PO 30 tons/ha + PK 100 kg/ha	0.010 a	0.027 a	0.036 a	0.080 a	0.201 a
PO 30 tons/ha + PK 300 kg/ha	0.013 a	0.029 a	0.043 a	0.087 a	0.161 a
PO 30 tons/ha + PK 500 kg/ha	0.009 a	0.026 a	0.083 a	0.060 a	0.097 a

*** Description:** The average values followed by the same letter in the same column are not significantly different according to Duncan's Multiple Range Test at the 5% level; DAP (Days After Planting); PO (Poration); PK (NPK Phonska).

According to Gardner et al. (1991), the leaf area index can be used to describe the total chlorophyll content of the leaves of each plant. The wider the leaf surface, the more chlorophyll is expected to be present. The leaf area index is a description of the ratio of the leaf surface to the land area occupied by the plant. The intensity of sunlight greatly affects the optimal growth of plants with different leaf area indices depending on the height of the plant and the amount of sunlight received by the plant.

The Leaf Area Index value is used as an indicator of canopy density biomass and a determinant of how much evapotranspiration is in a plant. The factors that affect the Leaf Area Index value are the growth phase, plant density, and nutrient supply, including N elements that affect the size of the leaf area (Qasim et al. 2014). Another factor that affects the leaf area index is the amount of air available to the plant. The more optimal the air available, the more maximum plant growth can be achieved.

Net Assimilation Rate

The results of the analysis showed that the combination of goat manure poration and NPK Phonska fertilizer had a significant effect on the plant age period of 37-41 DPA. Complete data is presented in Table 3.

Table 3 The Effect of Goat Manure Poration and Phonska NPK Fertilizer on Net Assimilation Rate (g/m^2/day) periode umur 25 DAP, 29 DAP, 33 DAP, 37 DAP dan 41 DAP

Treatment	Net Assimilation Rate (g/m^2/day)			
	25-29 DAP	29-33 DAP	33-37 DAP	37-41 DAP
Control	0.0045 a	0.0015 a	0.0022 a	0.0010 a
PO 0 tons/ha+PK 500 kg/ha	0.0024 a	0.0004 a	0.0012 a	0.0043 e
PO 30 tons/ha+PK 0 kg/ha	0.0031 a	0.0023 a	0.0025 a	0.0040 cde
PO 10 tons/ha+PK 100 kg/ha	0.0018 a	0.0019 a	0.0028 a	0.0033 bc
PO 10 tons/ha + PK 300 kg/ha	0.0023 a	0.0024 a	0.0018 a	0.0030 b
PO 10 tons/ha + PK 500 kg/ha	0.0025 a	0.0010 a	0.0027 a	0.0033 bc
PO 20 tons/ha + PK 100 kg/ha	0.0027 a	0.0033 a	0.0015 a	0.0033 bc
PO 20 tons/ha + PK 300 kg/ha	0.0018 a	0.0016 a	0.0030 a	0.0040 de
PO 20 tons/ha + PK 500 kg/ha	0.0013 a	0.0022 a	0.0030 a	0.0037 cd
PO 30 tons/ha + PK 100 kg/ha	0.0023 a	0.0012 a	0.0024 a	0.0037 cd
PO 30 tons/ha + PK 300 kg/ha	0.0056 a	0.0018 a	0.0027 a	0.0037 cd
PO 30 tons/ha + PK 500 kg/ha	0.0028 a	0.0014 a	0.0005 a	0.0033 bc

*** Description:** The average values followed by the same letter in the same column are not significantly different according to Duncan's Multiple Range Test at the 5% level; DAP (Days After Planting); PO (Poration); PK (NPK Phonska).

The Net Assimilation Rate of chili plants according to the observation time with a time interval of 4 days in different combinations of goat manure poration and NPK Phonska fertilizers can be seen in Table 4. The table shows that the net assimilation rate value has no significant effect for all treatments up to the age of 33

DPA; the net assimilation rate value increases in the plant age period of 37-41 DPA, then decreases along with the increasing age of the chili. At the beginning of growth, the net assimilation rate value increases, allegedly because when the plants are still small, the leaves of the plants do not shade each other so that the interception of solar radiation by the leaves of the chili plant is still high so that the photosynthesis apparatus increases.

The results of the Net Assimilation Rate of chili plants in different combinations of goat manure poration and NPK Phonska fertilizers can be seen in Figure 1.

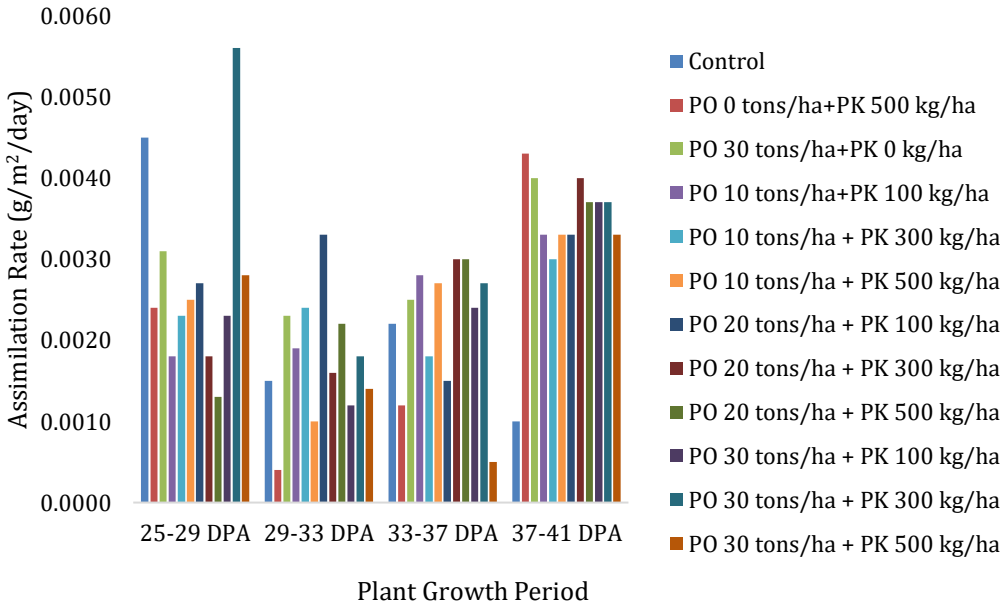

Figure 1 Net Assimilation Rate

Figure 1 shows the growth pattern of the Net Assimilation Rate for all treatments, indicating that at the beginning of growth up to 37 DPA, the Net Assimilation Rate increased and then decreased along with the increasing age of the chili. The net assimilation rate is a measure of the photosynthetic ability to produce dry matter from plants. The leaf area is closely related to the net assimilation rate. If the leaves are wider, the net assimilation rate will increase, but leaves that are too wide will reduce the net assimilation rate.

According to Gardner et al. (1991), the net assimilation rate is a measure of the average efficiency of leaf photosynthesis in a plant community. The net assimilation rate is higher in the early vegetative stage when the plants are still small, and some of the leaves are exposed to direct sunlight. Young leaves have a high CO_2 rate because they absorb the most radiation, so they can translocate a number of photosynthates to other parts of the plant. In contrast, old leaves in the lower and sheltered canopy have a low CO_2 rate and provide little photosynthesis to other parts of the plant.

At a later age, the larger the plant, the number of leaves and their surface area also increase. In this condition, the leaves are shaded by each other so that the leaf area that can intercept sunlight is reduced. As a result, the assimilation rate decreases, and the net assimilation rate decreases. According to Mabsani et al. (2016) and Juhaeni (2020), the net assimilation rate is lower at the generative stage. However, as the leaf

area increases, it is not accompanied by a high rate of photosynthesis, so assimilation activity decreases.

Plant Growth Rate

Based on the results of statistical analysis, it shows that the combination treatment of goat manure portion and NPK Phonska fertilizer has a significant effect on the plant age period of 29-33 DPA in the combination treatment of goat manure poration 10 tons/ha + NPK Phonska 300 kg/ha, and goat manure poration 10 tons/ha + NPK Phonska 100 kg/ha and at the plant, on 37-41 DAP shows a greater plant growth rate value in the combination treatment of goat manure poration 30 tons/ha + NPK Phonska 0 kg/ha compared to the control and other treatments. Plant growth rate data can be seen in Figure2.

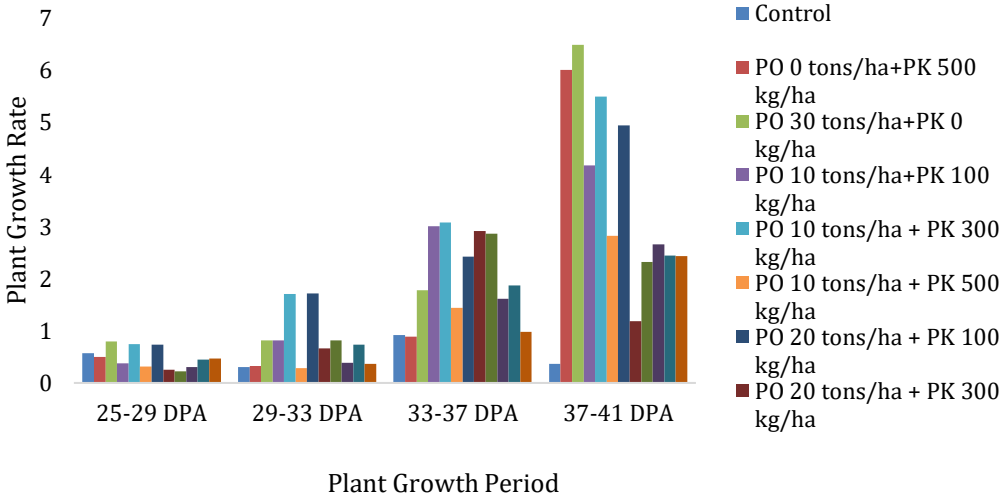

Figure 2 Plant Growth Rate

The plant growth rate graph in Figure 2 is assumed based on the results of the Duncan multiple range test conducted. The results of the analysis mean that the combination treatment of goat manure poration and NPK Phonska fertilizer in the 25-29 DPA age period and the 33-37 DPA age period did not have a significant effect on the growth pattern of Plant Growth Rate, only in the 29-33 DPA age period and the 37-41 DPA age period did it have a significant effect on Plant Growth Rate. Like the net assimilation rate, plant growth rate is also determined by, among others, the interception of solar radiation, and increasing the interception of solar radiation by chili plants will increase the rate of photosynthesis. Increased photosynthate, followed by the absorption of water and nutrients, will stimulate the formation of dry matter in plants.

Siaga et al. (2018) stated that the Plant growth rate is faster in the vegetative phase in the early weeks and then gradually decreases after the chili reaches its peak flowering period. The plant growth rate is more regulated by physiological activity (photosynthesis and respiration).

Number of Fruits per Plant

The combination treatment of goat manure poration and NPK Phonska fertilizer significantly affected the number of fruits per plant. The results of the test on the number of fruits per plant are presented in Table 4.

Tabel 4 Effect of goat manure poration and NPK Phonska fertilizer on Number of Fruits per Plant

Treatment	Number of Fruits per Plant
Control	48 a
PO 0 tons/ha+PK 500 kg/ha	176,3 de
PO 30 tons/ha+PK 0 kg/ha	52,3 a
PO 10 tons/ha+PK 100 kg/ha	160,0 bc
PO 10 tons/ha + PK 300 kg/ha	174,7 d
PO 10 tons/ha + PK 500 kg/ha	172,7 c
PO 20 tons/ha + PK 100 kg/ha	239,3 g
PO 20 tons/ha + PK 300 kg/ha	210,7 f
PO 20 tons/ha + PK 500 kg/ha	197,0 ef
PO 30 tons/ha + PK 100 kg/ha	157,3 bc
PO 30 tons/ha + PK 300 kg/ha	143,0 b
PO 30 tons/ha + PK 500 kg/ha	174,3 cd

*** Description:** The average values followed by the same letter in the same column are not significantly different according to Duncan's Multiple Range Test at the 5% level; DAP (Days After Planting); PO (Poration); PK (NPK Phonska).

The number of chili fruits per plant showed significantly different results in all treatments compared to the control. The combination treatment of 20 t/ha goat manure poration and 100 kg/ha NPK Phonska fertilizer produced the highest number of chili fruits per plant compared to other treatments and the control. It is suspected that the combination treatment of goat manure poration and NPK Phonska fertilizer has met the nutritional needs of chili plants in fruit formation, especially the nutrients N, P, and K. In addition, the organic material provided has been well-decomposed thanks to the provision of portion in the plot treatment. The microbial activity contained in M-BIO helps the process of decomposing organic material from goat manure well and increases the availability of nutrients for plants, one of which is phosphate-solubilizing bacteria, so that plants easily absorb nutrients. According to Prasetyo (2014) the use of NPK fertilizer makes chili plants contain a lot of chlorophyll so that they are greener and fresher, the stems become strong and upright, can reduce the risk of falling over, increase plant resistance to pests, diseases and drought, stimulate root growth and good root systems, stimulate the formation of flowers, fruits, tubers and seeds, accelerate harvesting and increase protein content, reduce the risk of damage during transportation and storage, facilitate the process of sugar and starch formation. In addition, the provision of organic matter to chili plants has been well decomposed and shows that adding organic fertilizer can meet the needs of plant nutrients. Addieny's research (2011) showed that organic fertilizers that enrich microbial activators increase yields in chili plants. Microbes in fermented fertilizers (poration) are significant for the availability of nutrients and the solubility of nutrients needed by plants for growth and increased crop yields.

Fruit Weight per Plant

The combination of goat manure poration and NPK Phonska fertilizer significantly affected the fruit weight per plant. The combination treatment of goat manure portion 20 tons/ha + NPK Phonska 100 kg/ha and the combination of goat manure portion 20 tons/ha and NPK Phonska 300 kg/ha produced the heaviest fruit weight per plant compared to other combinations of goat manure portion and NPK Phonska treatments and controls. It is suspected that the combination treatment of goat manure portion and NPK Phonska fertilizer is sufficient to meet the nutritional needs of chili plants in fruit formation, especially the nutrients N, P, and K, including the role of microbial activity in M-BIO which helps in the decomposition of organic matter so that it facilitates the availability of nutrients and is ready to be absorbed by plant roots. Organic matter that is already available in the soil is then given poration treatment, which can accelerate the decomposition process or faster decomposition so that nutrients can be easily absorbed by plants and cause the soil to become looser and plant growth to be better. The nutrients N, P, and K in plants can accelerate flowering, seed, and fruit development and help the formation of carbohydrates, fats, proteins, and various other compounds (Hardjowigeno, 1995).

Tabel 5 Pengaruh Porasi Kotoran Kambing dan Pupuk NPK Phonska terhadap Bobot Buah per Tanaman

Treatment	Bobot Buah per Tanaman (g)
Control	125.7 a
PO 0 tons/ha+PK 500 kg/ha	356.5 cd
PO 30 tons/ha+PK 0 kg/ha	127.9 a
PO 10 tons/ha+PK 100 kg/ha	320.7 bc
PO 10 tons/ha + PK 300 kg/ha	377.4 de
PO 10 tons/ha + PK 500 kg/ha	376.4 d
PO 20 tons/ha + PK 100 kg/ha	460.9 f
PO 20 tons/ha + PK 300 kg/ha	453.6 f
PO 20 tons/ha + PK 500 kg/ha	397.0 e
PO 30 tons/ha + PK 100 kg/ha	332.5 cd
PO 30 tons/ha + PK 300 kg/ha	283.1 b
PO 30 tons/ha + PK 500 kg/ha	283.6 b

*** Description:** The average values followed by the same letter in the same column are not significantly different according to Duncan's Multiple Range Test at the 5% level; DAP (Days After Planting); PO (Poration); PK (NPK Phonska).

Nutrients in the soil and the addition of fertilizers play a very important role in the generative phase, such as the formation of fruit and the number of fruits and fruit weight. Nutrient elements P and K play an active role in this phase because the P element accelerates flowering, seed ripening, and fruit. K nutrition strengthens parts of the plant body, such as leaves, flowers, and fruits that are not easily shed, increases plant resistance to drought and disease, and improves seed quality (Lingga and Marsono, 2007).

Bobot Buah per Satuan Lahan

The combination treatment of 20 tons/ha poration and 100 kg/ha NPK Phonska and

20 tons/ha poration and 300 kg/ha NPK Phonska produced higher fruit weight per plot compared to other treatments and the control. This is because fruit formation is influenced by the nutrients N, P and K which are more in the treatment, and the microbial activity of M-Bio found in goat manure poration helps in the process of decomposing organic matter, facilitating the availability of nutrients and ready to be absorbed by plant roots. The presence of microbes from M-Bio is very important for the availability and solubility of nutrients needed by plants for growth and increased yields.

Poration plays a role in improving the physical properties of the soil, including increasing soil aggregates, reducing bulk density and increasing soil pores. Priyadi (2017) stated that poration when applied to the soil, will be able to increase the diversity and activity of soil microorganisms so that the decomposition of organic matter will take place faster. Addition of organic matter to the soil can not only increase soil fertility, the nutrients contained in organic matter are also used in the process of photosynthesis, namely as a component of carbohydrates, fats, proteins, minerals and vitamins that will be translocated to the fruit storage section. In addition, poration also functions as a granulator, namely improving the soil structure to increase the ability to retain water and increase the Cation Exchange Capacity (CEC) in the soil to be higher. Soil with a high Cation Exchange Capacity (CEC) can absorb and provide nutrients better than soil with a low Cation Exchange Capacity (CEC).

In the generative phase, starting from the formation of fruit, such as the number of fruits and fruit weight. In this phase, plants require P and K elements, which are more dominant than N elements. P nutrient play a role in fruit formation, and N elements play a role in the quality of the fruit. The fulfilment of N, P, and K nutrients can increase the number of fruits and fruit weight, which results from chilli plants.

CONCLUSION

From this study, the following conclusions can be drawn: The combination of goat manure and NPK Phonska fertilizer affects leaf area at 33 DAP, Net Assimilation Rate in the period 37-41 DAP, Plant Growth Rate in the period 29-33 DAP and 37-41 DAP, Number of Fruits per Plant (fruit), Fruit Weight per Plant (g/plant) and Fruit Weight per Plot (kg/plot). The combination treatment of goat manure 20 tons/ha and NPK Phonska fertilizer 100 kg/ha gave the best effect on the growth and yield of curly chili plants with a yield of 460.87 g/plant, 5.53 kg/plot or equivalent to 14.75 tons/ha.

SUGESTION

Based on the research results on the effect of the combination of goat manure portion and NPK Phonska on the growth and yield of curly chili plants (*Capsicum annum* L.), balanced fertilization is recommended in chili cultivation to make the use of chemical fertilizers in the community more efficient, namely by using 20 tons/ha of goat manure portion and 100 kg/ha of NPK Phonska fertilizer.

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