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Growth and Yield of Soyabean (Glycine *max (L.) Merr.)* With Fertilization Of Goat Cage and Bio-Growth

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Abstrak

Soybean is one of the third most essential crops after rice and maize, whose production still needs to be increased. One of the efforts to utilize less fertile land is using organic fertilizers in goat manure and Bio-Growth. This study aimed to obtain the best dose of goat manure and Bio-Growth for soybean growth and yield. This research has been carried out at the experimental garden of the Kubang Research and Assessment of Agricultural Technology (BPTP) Balitbangtan Riau from August to November 2021. The method is practical with a factorial Randomized Block Design (RBD) consisting of 2 factorials with 3 replications. The first factor is goat manure (K0: 0 tons/ha, K1: 10 tons/ha, and K2: 20 tons/ha); the second factor is Bio-Growth (B0: 0 ml/4 l water, B1: 72.5 ml/4 l water, B2: 145 ml/4 l water, and B3: 217.5 ml/4 l water). The height of the plant, the number of its leaves, the diameter of its stem, the number of its branches, the number of pods produced by each plant, the weight of pods produced by each plant, the total weight of pods, and the weight of one hundred seeds were all measured. The application of goat manure and Bio-Growth influenced the height of the plant, the number of leaves, the number of pods produced by each plant, the weight of each pod, the total weight of the pods, and the weight of one hundred seeds. It was determined that the interaction between the two treatments did not impact all experimental parameters. This study concludes that the best application of goat manure is 10 tons/ha, while the most efficient Bio-Growth dose of 72.5 ml/4 l of water can increase the growth and yield of organic soybeans.

1. Introduction

Soybeans (*Glycine max* (L.) Morris is the third most important crop for human survival, followed by rice and maize. This plant yields a food product that is high in the protein found in vegetables and has been used as a raw material in the production of processed goods like tempeh, tofu, soy milk, and soy sauce, along with a lot of other kinds of snacks. Population growth and awareness of the importance of healthy living impact the increasing demand for soy every year. (Krisnawati, 2017). Indonesian farmers are currently just working to meet the country's most basic dietary requirements, so the country's rising demand for soybeans has not been met by correspondingly higher output levels.

The insufficiency of Indonesia's soybean production can be attributed to the lack of complete knowledge among farmers regarding the application of production technology that enables sustainable agriculture, in addition to the diminishing availability of plentiful land resources (Jumrawati, 2008). Along with an increase in human awareness about land resources that have decreased because of the sustainable use of inorganic fertilizers without being included with the application of organic fertilizers, this will have an impact on reduced soil fertility, which will lead to deficient levels of organic matter in the soil, which are less than 2%, and becomes a limiting factor in the ability to achieve high production. Meanwhile, to achieve optimal productivity, organic matter > 2.5% (Hairiah et al., 2000). This is in line with an increase in human awareness about land resources that have decreased because of the sustainable use of inorganic fertilizers without being.

The effect of Manure on improving soil fertility and increasing crop yields has long been known. According to Roidah (2013), Manure does not possess an exceptionally high nutritional content, but this sort of fertilizer could enhance the soil's physical features such as its transparency, properties, composition, and water retention power well as soil cations. Rismawan (2018) added that soil organic matter could be done by adding organic fertilizer to the soil with goat manure. The nutrient content of goat manure contains relatively higher potassium than other Manure (Kurnia and Melati, 2018). In addition, goat manure has a high level of N elements in the BPPP study (2006). It was stated that goat manure has a nitrogen content of 0.7% and a carbon to nitrogen ratio of 20-25, so it is anticipated that its use will result in less urea fertilizer. In the research of Rismawan et al. (2018), goat manure treatment of 20 tons/ha increased the total dry weight of soybean plants. In addition to applying organic fertilizer, namely goat manure, another type of fertilizer used to increase production is *Bio-Growth*.

Bio-Growth is waste from fermented slaughterhouses (RPH), which generally contain feed that has not been fully digested in the stomach of livestock. Oktiawan (2015) explained several types of microorganisms found in the rumen, such as a) Cellulose digesting microbes, b) Hemicellulose digesting microbes, c) Starch digesting microbes, d) Sugar digesting microbes, and e) Protein digesting microbes so that the contents of the rumen have the potential to be used as organic fertilizers both solid and liquid. So that the contents of the rumen have the potential to be used as organic fertilizers, both solid and liquid. According to the research findings (the Laboratory of the Faculty of Agriculture UNPAD, 2013), *Bio-Growth* contains good nutrients. Juniawaty and Yosefina (2009) added liquid organic fertilizer from the fermentation of cow rumen contents to increase the productivity of onion plants, especially the wet weight and dry weight of the bulbs and the diameter of onion bulbs. This is due to the unabsorbed food substances contained in it, so the implications are not much different from the content of food substances derived from ingredients (Dlamini and Dube, 2014).

However, the use of *Bio-Growth* in a study is still in the implementation stage, so the correct dose has not yet been determined. Seeing the potential that can be found in goat manure and *Bio-Growth* as alternative nutrient providers for soybean crops, the study was carried out "Soybean Growth and Yield (*Glycine max* (L.) Merr.) On Goat Manure and Bio-Growth".

2. Methods

This study was conducted in the Experimental Garden of the Riau Agricultural Research and Development Agency, located on Jl Kubang Raya, Kubang Jaya Village, Siak Hulu District, Kampar Regency, from August to November 2021. The materials used in this study were goat manure, *bio-growth*, water, and seeds of Anjasmoro Variety Soybeans (*Glycine max* (L.) Merr.). The tools used are hoes, tractors, machetes, meters, analytical time bags, cameras, drills, measuring cups, rulers, meters, and stationery. In this experiment, two different types of treatment were tested against each other in separate randomized control groups (RAKs). Goat manure, which goes through one of three processes, is the first consideration, namely: K0 = 0 tons / ha; K1 = 10 tons/ha; K2 = 20 tons/ha. The second factor is *Bio-Growth* which consists of 4 levels of treatment, namely: B0 = 0 ml / 4 l water (0 ml / 14 l water); B1 = 72.5 ml / 4 l of water (250 ml / 14 l of water); B2 = 145 ml / 4 l of water (500 ml / 14 l of water); B3 = 217.5 ml / 4 l of water (750 ml / 14 l of water).

3. Results and Discussion

3.1 Results

a. Plant Height

The results of the fingerprints show that the application of goat manure has a natural effect and on the application of *Bio-Growth* has a real impact on plant height, but there is no real interaction with soybean plant height. The average size of soybean crops can be seen in Table 4.1.

Table 4.1 Average Soybean Plant Height of 6 MST against Goat Manure Application and *Bio-Growth*

Treatment	Plant Height (cm)
Goat Manure	
0 ton/ ha	67.11[b]
10 ton/ ha	69.30[b]
20 ton/ ha	74.44[a]
Bio-Growth	
0 ml / 4 ℓ water	65.58[b]
72,5 ml/ 4 ℓ water	70.18[ab]
145 ml/ 4 ℓ water	71.14[a]
217,5 ml/ 4 ℓ water	74.24[a]

Description: The presence of multiple superscripts inside the same column indicates the presence of significant differences (P 0.05).

b. Number of Leaves

Table 4.2 Average Soybean Leaf Count of 6 MST against Goat Manure Application and *Bio-Growth*

Treatment	Number of Leaves (*trifoliate*)
Goat Manure	
0 ton/ ha	17.73[b]
10 ton/ ha	19.15[a]
20 ton/ ha	20.19[a]
Bio-Growth	
0 ml / 4 ℓ water	17.39[b]
72,5 ml/ 4 ℓ water	18.92[a]
145 ml/ 4 ℓ water	19.53[a]
217,5 ml/ 4 ℓ water	20.25[a]

Description: On the same column, different superscripts indicate discernible differences (P 0.01).

The treatment with goat manure significantly affects the number of leaves, whereas the treatment with Bio-Growth has a very noticeable impact on the number of soybean plants. The number of leaves produced by soybean plants responds noticeably and significantly to either treatment. There is no discernible

impact on the total number of leaves produced by soybean plants because of the myriad of interactions that involve goat manure and Bio-Growth. Table 4.2 provides an overview of soybean plants' typical number of leaves.

c. Rod Diameter

The results show that there is no influence on the application of goat manure, but there is an influence on *the Bio-Growth* treatment on the stem diameter of soybean plants and the interaction between goat manure and *Bio-Growth* has no natural effect. Table 4.3 illustrates the typical diameter of the stems of soybean plants.

Table 4.3 Rata-average Soybean Stem Diameter of 6 MST against Goat Manure Application and *Bio-Growth*

Treatment	Rod Diameter (mm)
Goat Manure	
0 ton/ ha	6.4
10 ton/ ha	6.76
20 ton/ ha	7.02
Bio-Growth	
0 ml / 4 ℓ water	5.99^{b}
72,5 ml/ 4 ℓ water	7.00^{a}
145 ml/ 4 ℓ water	6.69^{ab}
217,5 ml/ 4 ℓ water	7.23^{a}

Description: Different superscripts on the same column show noticeable differences (P<0.05)

d. Number of Branches

The results of the fingerprints show that the treatment of goat manure has an authentic effect on the number of branches and that Bio-Growth also has a genuine impact on the number of units of soybean crops. However, there is no real influence between goat manure application and Bio-Growth interaction. This is shown by the fact that the two treatments have no real influence. Table 4.4 overviews the specific number of branches produced by soybean crops.

Table 4.4 Average Number of Soybean Branches to Goat Manure and *Bio-Growth*

Treatment	Number Of Branches
Goat Manure	
0 ton/ ha	3.25^{c}
10 ton/ ha	3.48^{b}
20 ton/ ha	3.85^{a}
Bio-Growth	
0 ml / 4 ℓ water	3.19^{c}
72,5 ml/ 4 ℓ water	3.50^{b}
145 ml/ 4 ℓ water	3.69^{ab}
217,5 ml/ 4 ℓ water	3.72^{a}

Description: Different superscripts on the same column show noticeable differences (P<0.05).

e. Number of Pods Per Plant

According to the findings of the fingerprint analysis, goat manure has a natural effect, and the Bio Growth treatment has a noticeable impact on the number of pods produced by each plant, but there is no real interaction between the two variables. Table 4.5 overviews the specific number of pods produced by a soybean crop. Table 4.5 Average Number of Pods Per Soybean Crop against Goat Manure Application and *Bio-Growth*

Treatment	Number of Pods Per Plant
Goat Manure	
0 ton/ ha	50.75^{b}
10 ton/ ha	53.17^{ab}
20 ton/ ha	58.04^{a}
Bio-Growth	
0 ml / 4 ℓ water	48.00^{b}
72,5 ml/ 4 ℓ water	53.94^{ab}
145 ml/ 4 ℓ water	56.61^{a}
217,5 ml/ 4 ℓ water	57.39^{a}

Description: The presence of multiple superscripts within the same column indicates the presence of significant differences (P 0.05).

f. Pod Weight Per Plant (g)

Table 4.6 Average Pod Weight Per Soybean Crop against Goat Manure Application and *Bio-Growth*

Treatment	Pod Weight Per Plant
Goat Manure	
0 ton/ ha	60.81^{b}
10 ton/ ha	64.40^{ab}
20 ton/ ha	69.56^{a}
Bio-Growth	
0 ml / 4 ℓ water	58.19^{b}
72,5 ml/ 4 ℓ water	65.25^{ab}
145 ml/ 4 ℓ water	67.78^{a}
217,5 ml/ 4 ℓ water	68.47^{a}

Description: The presence of multiple superscripts within the same column indicates the presence of significant differences (P 0.05).

The results of the fingerprints show that there is an influence on the application of goat manure, and *the Bio Growth* treatment influences the weight of the pods per plant produced, but there is no interaction with the importance of the pods per plant. The average number of pods per soybean crop can be seen in Table 4.6.

g. Total Pod Weight (g/plot)

The results of the fingerprints show that the application of goat manure has no natural effect on the total pod weight, but the application of *Bio-Growth*, has a significant impact on the importance of the whole pods produced, and there is no interaction between the application of goat manure and *Bio Growth*. Table 4.7 provides information regarding the typical overall weight of soybean pods.

Table 4.7 Average Total Soybean Pod Weight to Goat Manure Application and *Bio-Growth*

Treatment	Total Pod Weight (g)
Goat Manure	
0 ton/ ha	931.3
10 ton/ ha	999.46
20 ton/ ha	1061.64
Bio-Growth	
0 ml / 4 ℓ water	855.11^{b}
72,5 ml/ 4 ℓ water	1001.78^{a}
145 ml/ 4 ℓ water	1045.00^{a}
217,5 ml/ 4 ℓ water	1087.18^{a}

Description: The presence of multiple superscripts within the same column indicates the presence of significant differences (P 0.05).

h. Weight 100 Seeds

According to Table 4.8, the dose treatment of goat manure increased the weight of 100 soybean seeds. This can be seen by looking at the table. Between 14.8 and 15.3 grams is what one hundred soybean seeds typically weigh on average.

Table 4.8 Rata-Average Weight of 100 Soybean Seeds against Goat Manure Application and *Bio-Growth*

Treatment	Weight 100 seeds (g)
Goat Manure	
0 ton/ ha	12.92^{b}
10 ton/ ha	14.25^{a}
20 ton/ ha	14.42^{a}
Bio-Growth	
0 ml / 4 ℓ water	13.11^{b}
72,5 ml/ 4 ℓ water	13.78^{b}
145 ml/ 4 ℓ water	13.89^{ab}
217,5 ml/ 4 ℓ water	14.67^{a}

Description: Different superscripts on the same column show noticeable differences (P<0.05).

3.2 Discussion

a. Plant Height

Table 4.1 shows that the treatment of higher doses of goat manure can increase plant height. The height of this plant is already by the description of the size of the anjasmoro soybean plant, which is 64-68 cm. The treatment of plants with goat manure doses results in the most significant increase in plant height. Of 20 tons/ha, which is 74.44 cm. This is thought to be because goat manure has N nutrients that can be sufficient for the vegetative growth of soybean plants. Safitri et al. (2017) (fertilizer made from goat manure) has a higher nitrogen content than other fertilizers and has been shown to promote increased vegetative development in plants. This is also due to the application of Manure, which functions to keep water available in the soil (Wayah et al., 2014).

Table 4.1 demonstrates that the Bio-Growth treatment has the potential to raise the overall height of soybean plants. The highest plant height is found in the dose of *Bio-Growth*, 217.5 ml / 4 l of water, which is 74.24 cm. This is thought to be because *Bio-Growth* can increase the available nutrients N, P, and K, which are essential in the vegetative growth process of soybean plants. This is following Kusdiyanti (2021), the application of rice husk ash and Bio Growth as an organic fertilizer can increase soil fertility so that it can increase the height of tomato plants. Sutoro (2003) says organic matter works in soil burial and will determine soil productivity and nutrient provision for plants.

b. Number of Leaves

The results of Table 4.2 show that the amount of goat manure applied at a specific dose level affects the leaves and that there is a correlation between the amount of goat manure used and the number of leaves. The treatment with goat manure doses of 20 tons/ha resulted in 20.19 percent more plant leaves than the control, which was the highest number of plant leaves. This is thought to be because goat manure has N, P, and K nutrients that can be sufficient for the vegetative growth of soybean plants. This follows Nurshanti's (2009) argument that the use of organic fertilizers for goat manure, cow dung, and chicken manure affects the height of the plant, the number of leaves, and the area of the leaves where the plant receives more nutrients through goat manure since it contains more nutrients and varied compared to cow and chicken manure. Following Hardjowigeno's (2007) statement, nitrogen is an essential element for plant

growth among the various nutrients. Nitrogen is a critical element in the development of plants and is beneficial to the vegetative growth of plants. Vegetative growth can be defined as an increase in the number of leaves a plant has. Nitrogen is an essential nutrient for plant growth. Nitrogen nutrients are beneficial for the vegetative growth of plants, and vegetative growth can be in the form of an increase in the number of leaves.

As seen in Table 4.2, treatments with a higher Bio-Growth dose can result in a more significant number of leaves being produced by soybean plants. The Bio-Growth dose treatment of 217.5 milliliters of Bio-Growth per four liters of water made the highest number of plant leaves overall, which was 20.25. It is believed that Bio-Growth can satisfy the nutrient requirements for the vegetative growth of soybean plants. According to Pranindar et al. (2017), composting the contents of the cow's rumen significantly affects the plant's height, number of leaves, the number of flowers, the fruit set, and the fresh weight of pods produced by each plant. This finding is consistent with their results. It is stated by Tambunan (2009) that plants will grow well and be fertile if the nutrients that plants require are sufficiently available to be absorbed by the plants. This theory is supported by the research of Tambunan (2009).

c. Rod Diameter

Table 4.3 shows that the dose treatment of goat manure did not have a noticeable effect on the diameter of soybean stalks. Gunawan's (2018) research states that the average diameter of soybean stalks variety anjasmoro at 6 MST ranges from 7.4 – 7.8 mm with biofertilizers and shows no noticeable effect. The average stem diameter of soybean plants in this study ranged from 6.40 – 7.02 mm smaller than the study by Gunawan. This is thought to be because the nutrients found in goat manure, especially N, do not show differences in the development of the stem diameter of soybean plants. This follows Hasibuan (2006), which states that N is needed in large quantities at each stage of plant growth, particularly the formation of buds and the development of stem diameter.

Table 4.3 also shows that higher *Bio-Growth* dose treatments can increase the stem diameter of soybean plants. The most heightened plant stem diameter was found in the *Bio-Growth* dose treatment of 217.5 ml / 4 l of water, which was 7.23 mm. It is believed that this is since Bio-Growth, thanks to the N element it contains, can stimulate the vegetative growth of soybean plants. Setyamidjaya (1986) said that element N promotes the development of plants almost as a whole. Therefore, the element nitrogen in plants is essential to healthy plant growth. According to Wulandari (2015), using organic fertilizers can improve soil nutrients due to the addition of microorganisms in the soil. This is consistent with the opinion presented here, as it is the same viewpoint.

d. Number of Branches

According to the results presented in Table 4.4, the dose treatment of goat manure has a significant impact on the total number of soybean branches. This is consistent with the description of the typical number of units found on anjasmoro soybeans, which ranges from 2.9 to 5.8 units on average. The application of goat manure at doses of 20 tons per hectare results in 3.85 times the average number of plant branches than any other treatment. It is believed that this is because the nutrients found in goat manure, in particular N, can fulfill the necessary nutrients for the growth of soybean plant branches. Dewanto et al. (2013) state that nitrogen nutrients benefit plants' growth and development; this agrees with their findings. This view is supported by the opinion of Safei et al. (2014), who stated that nitrogen is necessary for plants for vegetative growth of plants, particularly the development of stems, branches, and leaves. This view is supported by the opinion of Safei et al. (2014).

Table 4.4 shows that the dose treatment of *Bio-Growth* fertilizer has a very noticeable effect on the number of soybean branches. The highest number of plant branches was found in the *Bio-Growth* dose treatment of 217.5 ml / 4 l of water, which was 3.72. *Bio-Growth* Dosage Treatment 217.5 ml/ 4 ℓ air is the best treatment for the number of branches of the soybean plant. This is suspected because *Bio-Growth* with its N element 1.80% is enough for developing soybean plant branches. Novizan (2002) said that the N element increases plants' vegetative growth, such as the formation of components and the development of stems and leaves.

e. Number of Pods Per Plant

According to Table 4.5, the higher doses of goat manure were also followed by an increase in the number of soybean pods that formed on the plants. Roswita's (2020) investigation showed that the typical amount of soybean pods anjasmoro planted was 68.12 pieces. The dose treatment of goat manure that contained 20 tons of Manure per hectare produced the highest number of plant pods, which was 58.04, but it did not significantly differ from the dose treatment of goat manure that contained 10 tons of Manure per hectare, which included 53.17. It is believed that increasing the amount of goat manure added to the soil will lead to an increase in the number of nutrients that soybean plants will absorb. This is in addition to applying organic fertilizers, including goat manure and Bio-Growth, which will contain a sufficient supply of N nutrients. According to Adisarwanto (2005), the quantity of nitrogen absorbed by plants from the soil is initially deposited in the stems and leaves of the plant. Subsequently, pods are formed, and nitrogen is collected in the skin of the pod; and supported by Puspasari (2018), if the provision of N elements in the soil that are sufficient, it can provide good seed filling, where nitrogen is one of the essential nutrients that every plant in sufficiently large quantities requires.

Table 4.5 also shows that *bio-growth* dose treatments can increase the number of soybean pods. The highest number of pods was found in the *Bio-Growth* dose treatment of 217.5 milliliters / 4 l of water, which was 57.39 and did not differ markedly from the bio-growth dose treatment of 72.5 milliliters / 4 1 liter of water and 145 milliliters / 4 l of water, namely 53.94 and 56.61. This is thought to be because plants can utilize macro (K) and micronutrients (Ca, Mg and Cu) in *Bio-Growth*, where K elements play a vital role in forming pods in soybean plants. The higher the K element, the more perfect the formation and filling of the pods (Hanibal, 2021). Rinsema (1993) also stated that the addition of liquid organic fertilizer helps meet the needs of macro and micronutrients for soybean cultivation. In contrast to Kusdiyanti's (2021) research which failed to harvest tomato plants fed with rice husk ash and *bio-growth* due to pest and disease attacks due to the use of varieties that are not resistant to pests and diseases.

f. Pod Weight Per Plant (g)

Table 4.6 shows that the dose treatment of goat manure influences the weight of pods per soybean crop. Haitami et al. (2021) stated that the average weight of anjasmoro soybean pods is around 47.95 g in ultisol soils. The highest weight of pods per soybean plant was found in the goat manure dose treatment of 20 tons/ha, which was 69.56 g, and did not differ markedly from the dose treatment of goat manure of 10 tons/ha, which was 64.40 g. This is thought to be because the K element contained in goat manure can meet the nutrient needs of soybean pods. Compared to other manure, goat manure contains higher K nutrients, while N and P nutrients are almost the same as other manures. Potassium (K) serves to stimulate the development of hearts and flowers. This is supported by the opinion of Dinariani et al. (2014), which states that the application of goat manure fertilizer at the time of tillage will be well decomposed so that plant roots quickly absorb it. Sari et al. (2015) stated that goat feces contain N and K twice as much as cow dung. Goat feces contain a higher P than goat urine.

Table 4.6 also shows that *bio-growth* dose treatments can increase the weight of pods per soybean crop. The highest weight of pods per plant was found in the *Bio-Growth* dose treatment of 217.5 ml / 4 l of water, which was 68.47 g and did not differ markedly from the bio-growth dose treatment of 72.5 ml / 4 l of water and 145 ml / 4 l of water, namely 65.25 and 67.78 g. This is thought to be because of the nutrients in *the Bio-Growth* given, one of which contains P and K nutrients for developing soybean pods and seeds. The content of P nutrients sourced from Bio Growth of 2.61% and K of 1.20% for fruit formation is available to plants. Nilawati et al. (2017) said that the more the number of fruits harvested, the greater the weight of the fruit per plant produced. Such results are positively correlated with the number of pods per crop produced.

g. Total Pod Weight (g/plot)

According to the data presented in Table 4.7, the dose treatment of goat manure has no impact on the overall pod weight of soybeans. The highest total soybean pod weight was found in the goat manure dose treatment of 20 tons/ha, which was 1061.64 g and was not significantly different from the treatment without goat manure and 10 tons/ha 999.46 and 931.3 g. This is suspected to be because goat manure has not been able to meet the needs of P nutrients for the growth of soybean pods. Following research conducted by Murtinah et al. (2020), Goat pukan has a P element smaller than chicken pukan. Nutrient P plays a crucial role in the generative growth of plants.

Table 4.7 shows that *bio-growth* dose treatments can increase the total pod weight of soybeans. The bio-growth dose treatment of 217.5 ml / 4 l of water produced the highest full B close pods, which weighed 1087.18 g. This treatment did not significantly differ from the bio-growth dose treatments of 72.5 ml / 4 l of water and 145 ml / 4 l of water, which produced 1001.78 and 1045.00 g, respectively. This is thought to be because *Bio-Growth* can provide N, P, and K nutrients in the formation and cooking of soybean seeds. The availability of N can increase the uptake of P and K elements available in sufficient quantities and can be utilized by plants for their metabolic activity in the phase of plant pod formation. Primanto (1998) stated that in the generative period, plants need many nutrients, namely phosphorus, and potassium, to produce energy for plants.

h. Weight 100 Seeds

The treatment with the highest dose of goat manure, which was 20 tons/ha, resulted in 100 seeds weighing 14.42 grams. This weight did not significantly differ from 100 seeds treated with a dose of goat manure equal to 10 tons/ha, which was 14.25 grams. It is believed that this is because goat manure can boost the number of microorganisms in the soil, which is necessary for developing soybean seeds. This is in addition to providing nutrients for plants. This is supported by the opinion of Subatra (2013), who states that Manure will gradually be decomposed, and the nutrients from the decomposition process will slowly also be available to plants. According to Dinariani et al. (2014), applying organic fertilizers at the tillage would result in the fertilizer being well decomposed and easily absorbed by the plant roots. According to Soeprapto (2002), the weight of 100 seeds belongs to properties that have a low variety and a high heritability value. This means the trait is more controlled by genetic factors than environmental factors.

According to the data presented in Table 4.8, the bio-growth dose treatment successfully increased the total weight of 100 soybean seeds. The importance of 100 soybean seeds ranges from 14.8 to 15.3 grams. The bio-growth

dose treatment that contained 217.5 milliliters per four liters of water yielded the highest weight of 100 seeds, 14.67 grams. This weight was not significantly different from the bio-growth dose treatment that contained 145 milliliters per four liters of water, which yielded 13.89 grams. The Bio-Growth dose treatment of 217.5 ml / 4 l of water applied to soils is the most effective in terms of the weight parameters of 100 soybean seeds. It is believed that this is because the nitrogen, phosphorus, and potassium levels found in Bio-Growth are sufficient for the growth of soybean seeds. During the seed filling process, the valuable nutrients nitrogen, phosphorus, and potassium contained in the Bio-Growth utilized are essential. According to Sari (2013), using liquid organic fertilizers that contain nitrogen, phosphorus, and potassium can improve the vegetative growth of plants. This occurs due to an increase in the total leaf area and the amount of chlorophyll, which are directly related to the process of photosynthesis.

Additionally, an increase in production yields occurs due to the accumulation of photosynthesis on the seeds. Because it is a component of the proteins that plants will use, the element nitrogen (N) plays a significant part in increasing the number of successfully filled pods. It is one of the roles that Unser P plays in the supply and transfer of energy throughout the biochemical processes that plants go through. One of these roles is to speed up the ripening process and encourage the development of pods so that the seeds can have a high weight-to-value ratio.

4. Conclusion

The following inferences are tenable considering the findings of the research that has been carried out:

1. A treatment with goat manure at a rate of 10 tons per hectare can lead to an increase in the number of leaves, the number of pods produced by each plant, the weight of pods produced by each plant, and the weight of 100 seeds.
2. The application of a Bio-Growth treatment comprising 72.5 milliliters and four liters of water has the potential to increase the height of the plant, the number of leaves, the stepmother stationary, the number of pods produced by the plant, the weight of pods produced by the plant, and the total weight of the pods.
3. There was no interaction between the goat manure treatment and the bio-growth parameters in any of the observations.

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