Tumbuhan : Publikasi Ilmu Sosiologi Pertanian Dan Ilmu Kehutanan
Volume. 2 Nomor. 2 May 2025
e-ISSN : 3032-758X; p-ISSN : 3046-5400, Page. 97-113
DOI: https://doi.org/10.62951/tumbuhan.v2i2.326
Available online at: https://journal.asritani.or.id/index.php/Tumbuhan

Optimization of Shallot Growth and Production through Cow Manure Application and Eco Farming (*Allium ascalonicum* L.)

Efbertias Sitorus[1*], Pantas Simanjutak[2], Lince Romauli Panataria[3], Meylin Kristina Saragih[4], Rio Adesta Hutauruk[5]
[1,2,3,4,5] Universitas Methodist Indionesia, Indonesia

Alamat: Jl. Hang Tuah No. 8, Medan 20152.
Korespondensi penulis: efbertias.sitorus35@gmail.com

***Abstract**. This study aims to determine the effect of cow manure and liquid organic fertilizer eco farming on the growth and production of shallots (Allium ascalonicum L.). This research method uses a Factorial Randomized Block Design (RAK) consisting of 2 factors. The first factor is cow manure (P) consisting of 4 treatment levels, namely: P0 = Control (Without Compost), P1 = 0.5 kg/plot (5 tons/ha), P2 = 1.0 kg/plot (10 tons/ha) and P3 = 1.5 kg/plot (15 tons/ha). The second factor: Eco Farming consists of 3 treatment levels: C1 = 150 ml/plot, C2 = 250 ml/plot, and C3 = 350 ml/plot. The study's results showed that the provision of cow manure significantly affected plant height, number of leaves, wet weight of tubers per sample, and wet weight of tubers per plot. Providing eco farming impacts plant height, number of leaves, dry weight of tubers per sample, and wet weight of tubers per plot. The interaction between cow manure and eco farming had no significant effect on plant height, number of leaves, dry weight of tubers per sample, and wet weight of tubers per plot.*

***Keywords**: cow manure, eco farming, red onion*

1. INTRODUCTION

Shallots (Allium Ascalonicum L.) are one of the necessities. However, household consumers cannot avoid the need for shallots to complement everyday cooking spices.(Iswahyudi & Juanda, 2024; Permatasari, 2021). Besides, shallots can also be used as a traditional medicine, the benefits of which have been felt by the wider community. Likewise, the rapid growth of the food processing industry lately also tends to increase the need for shallots domestically. Shallots are also one of the leading commodities in several regions in Indonesia, which are used as cooking spices and have a content of several substances that are beneficial to health, and their properties as anti-cancer substances and antibiotic substitutes, lowering blood pressure, cholesterol, and lowering blood sugar levels(Gultom et al., 2022; Hasnelly & Gatot, 2020; Pratiwi, 2021).

Data from the Central Statistics Agency shows that shallots are the vegetable with the highest production in 2022. The highest production results were in 2022. The production of shallots from all provinces in Indonesia has almost reached 2 million tons. Even so, this number decreased compared to the production in 2021, which reached 2,004,590 tons. The Central Statistics Agency (BPS) noted that shallot production in Indonesia reached 1.82 million tons in 2020. This number increased by 14.88% from the previous year, 1.58 million tons. In 2019, the amount of shallot production increased to 1,580,247 tons.

Received: Maret 30, 2025; Revised: April 30, 2025; Accepted: Mei 13, 2025;
Online Available : Mei 17, 2025;

The need for shallots continues to increase along with the increasing population. Therefore, it is necessary to apply the proper cultivation techniques and fertilization methods to the growth and production of shallots. One thing that greatly influences shallot production is the availability of nutrients needed by plants, so it is necessary to add nutrients through fertilization to increase shallot production.(Barus et al., 2021; Hasnelly & Gatot, 2020).

Manure can improve the structure so that the roots of shallot plants can freely absorb all the nutrients in the soil.(Rodrian, 2022). Eco Farming liquid organic fertilizer also has plant growth hormones and macro and micro nutrients. This POC has good benefits for plant growth. This liquid organic fertilizer contains beneficial microorganisms in the form of decomposer bacteria, nitrogen-fixing bacteria, and phosphate-dissolving bacteria. Decomposer bacteria play a role in the decomposition process of organic materials, both from plant residues and other living things. Decomposer bacteria are essential for carbon decomposition in the soil(Garfansa et al., 2021; Prasetyo et al., 2022).

According to(Sanapiah et al., 2021) (2021), the advantages of organic fertilizer in Eco Farming are that it allows the soil to ferment. In addition, Eco Farming organic fertilizer is also enriched with macro and micro nutrients, organic acids that stimulate nutrification, growth hormones, and active microbes. As for other advantages, according to(Cahyawati et al., 2022; Louto & Shamdas, 2022)that Eco Farming organic fertilizer is: improving soil fertility, dissolving and providing phosphate, producing several growth enzymes from selected microbes in Eco Farming, reducing the use of chemical fertilizers by 25% in the early stages, controlling and preventing pathogen attacks on plants, helping growth and helping plants produce quality production results stimulantly, accelerating fruit ripening and plant growth, maintaining plant health, increasing the quantity of plant production, breaking down toxic compounds for plants slowly, and safe for the environment and living things. Eco Farming can meet 13 nutrients for all types of plants. Macro nutrients (N, P, K) Secondary nutrients (S, Ca, Mg). Micro nutrients (Cl, Mn, Fe, Cu, Zn, B, Mo) content of Eco Farming C - Organic (51.60%), C/N (15.24), N-total (3.35%), P205 (4.84%), K20 (1.47%), Water content (15.32%), pH (7.05)(Farabi et al., 2023; Pardede & Fathurrahman, 2024).

2. LITERATURE REVIEW

Cow Manure:

In the onion growth procedure, the majority of farmers in Indonesia are compelled to utilize inorganic fertilizers. They readily administer inorganic fertilizer in quantities above the prescribed dosage. Nonetheless, inorganic fertilizers impact soil fertility. The soil exhibits increased acidity, leading to heightened compaction and a reduction in microbial populations. Plant development and yield are affected by suboptimal soil conditions. The conversion of agricultural land to non-agricultural uses results in a yearly reduction of agricultural land, while the demand for agricultural products, particularly shallots, continues to rise. Organic materials are employed to rejuvenate soil fertility. An alternative to enhance soil fertility is cow manure. In addition to enriching the soil, they are readily accessible to farmers. An adult cow can produce thirty kg of dung daily (Taga et al., 2024).

Cow manure contains nitrogen (N), phosphorus (P), and potassium (K), essential nutrients for plants. Additionally, it can enhance the soil's physical qualities, including water retention capacity, total pore volume, and aggregate stability (Sulardi, 2020). Productivity can be enhanced by augmenting the fertility of this land. Research by (Hariyadi et al., 2021) indicates that manure application at 20 tons per hectare resulted in an increase to 6.30 tons per hectare, or an enhancement of 2.2 tons, relative to the absence of manure.

Liquid organic fertilizer derived from natural farms

Organic fertilizer is composed of naturally occurring elements, such as manure, green manure, or plant leftovers. Organic fertilizer comprises the quantity, variety, and naturally occurring nutrients it contains. Organic fertilizer is a crucial component for enhancing soil fertility and improving land quality sustainably. Organic fertilizer possesses numerous advantages compared to inorganic fertilizer. In addition to being sustainable, organic fertilizer enhances the physical, chemical, and biological characteristics of soil. Organic fertilizer encompasses all macro and micronutrients, hence enhancing soil aggregation and structure resilience. Organic fertilizer may retain 10 times its dry weight in water, hence enhancing water availability for plants. Biologically, organic fertilizer enhances the reproduction of living organisms by augmenting the organic matter and energy sources in the soil, hence facilitating nutrient absorption (Lizta, 2022; Sulistyaningsih, 2019).

Ecological fertilizer offers numerous advantages, such as enriching or aerating the soil, rendering previously unavailable nutrients accessible through diverse decomposition processes, stimulating soil microorganisms to enhance fertility, reducing soil pH or acidity, and augmenting nutrient availability in the soil (Lizta, 2022). While organic fertilizers help sustain soil health, they do not enhance plant resistance and output. The inherent dangers of loss associated with the actions adopted have rendered this issue a significant concern for farmers. Consequently, the integration of organic fertilizer and biofertilizer in nutrient processing has emerged. (Rizal et al., 2024) characterizes Eco Farming as a potent organic fertilizer or nutrient that encompasses all essential elements required by plants and is infused with beneficial microbes to serve as a biocatalyst. Eco Farming offers three advantages for soil: enhancing soil nutrients, decomposing organic matter, and normalizing pH levels.

3. RESEARCH METHODS

This research was conducted on community land on Jl. Bunga Herba III, Medan Selayang District, Sempakata Village, Medan City, with an altitude of ±30 meters above sea level. This research method used a Factorial Randomized Block Design (RAK) consisting of 2 factors. The first factor is cow manure (P) consisting of 4 treatment levels, namely: P0 = Control (Without Compost), P1 = 0.5 kg/plot (5 tons/ha), P2 = 1.0 kg/plot (10 tons/ha) and P3 = 1.5 kg/plot (15 tons/ha). The second factor is the Provision of Eco Farming, consisting of 3 treatment levels: C1 = 150 ml/plot, C2 = 250 ml/plot, and C3 = 350 ml/plot. The observation parameters in this study were plant height, number of leaves, wet weight of tubers per sample, and wet weight of tubers per plot. Factors that significantly influence the variance test analysis are then tested for average differences using the Duncan test (DMRT) at the 5% level and the response curve for the treatment.

4. RESULT AND DISCUSSION

Research result

1) Plant Height (cm)

Plant height data at 2, 3, 4, and 5 MST due to cow manure and eco farming treatments. The analysis of variance list shows that cow manure treatment has a significant effect on plant height at the ages of 3, 4, and 5 MST, but not significant at the age of 2 MST. Eco farming treatment has a significant effect on plant height at the age of 5 MST, but not significant at the ages of 2, 3, and 4 MST. The interaction between the two treatments has no significant effect on plant height. Table 2 presents the average height of shallot plants at 2, 3, 4, and 5 MST.

Table 1. Average Plant Height (cm) of Shallots in Cow Manure and Eco Farming Treatments at Ages 2, 3, 4, and 5 MST

Treatment	Plant Height			
	2 MST	3 MST	4 MST	5 MSt
P0	22.33	27.77b	30.74b	32.40b
P1	22.42	28.26b	31.42b	33.12b
P2	22.84	29.34a	32.54a	34.22a
P3	22.63	29.16a	32.29a	34.43a
C1	22.10	28.15	31.26	32.93b
C2	22.55	28.63	31.74	33.61ab
C3	23.02	29.12	32.25	34.10a
P0C1	22.13	27.53	30.24	31.87

P0C2	21.78	27,28	30.38	32.08
P0C3	23.09	28.49	31.59	33.24
P1C1	22.01	27.81	30.91	32.61
P1C2	22.52	28.32	31.63	33.33
P1C3	22.74	28.64	31.74	33.44
P2C1	22.21	28.71	32.03	33.67
P2C2	23.53	30.03	32.95	34.65
P2C3	22.79	29.29	32.65	34.35
P3C1	22.05	28.55	31.88	33.58
P3C2	22.38	28.88	31.98	34.36
P3C3	23.47	30.05	33.01	35.36

Description: Numbers followed by the same letter in the same column mean that they are not significantly different in the DMRT test at a 5% test level.

Table 1 indicates that in the treatment of cow manure at 3 and 4 MST, the tallest plants were observed in treatment P2, which was statistically different from P0 and P1, but not significantly different from P3. The height of plants in treatment P3 exhibited a significant difference compared to P0 and P1. The height of plants under treatment P1 did not differ substantially from that in P0. At 5 MST, the tallest plants were observed in treatment P3, which was statistically different from P0 and P1, but not significantly different from P2. The height of plants in treatment P2 differed substantially from that in P0 and P1, although the height of plants in treatment P1 did not differ significantly from P0. The impact of cow dung on the height of shallot plants at 5 MST is illustrated in Figure 1.

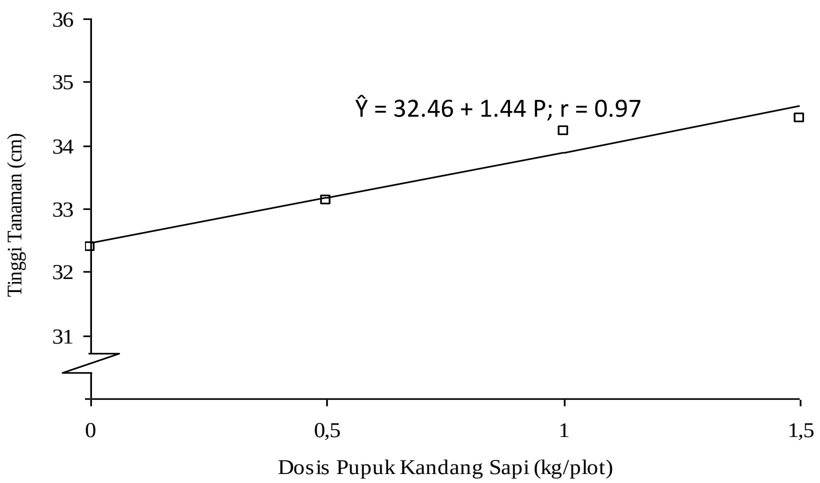

Figure 1. Effect of Cow Manure on the Height of Red Onion Plants 5 Weeks After Planting

Figure 1 illustrates that an increase in cow dung dosage correlates with an elevation in shallot plant height, according to a positive linear regression trend. Augmenting the dosage of cow dung by 1 kg per plot can enhance plant height growth by 1.44 cm. Table 1 indicates that in the eco farming treatment at 5 MST, the tallest plants were observed in treatment C3, which was considerably different from C1, but not significantly different from C2. The height of plants in treatment C2 was markedly distinct from that in treatment C1. The impact of eco-farming on the height of shallot plants at 5 MST is illustrated in Figure 2.

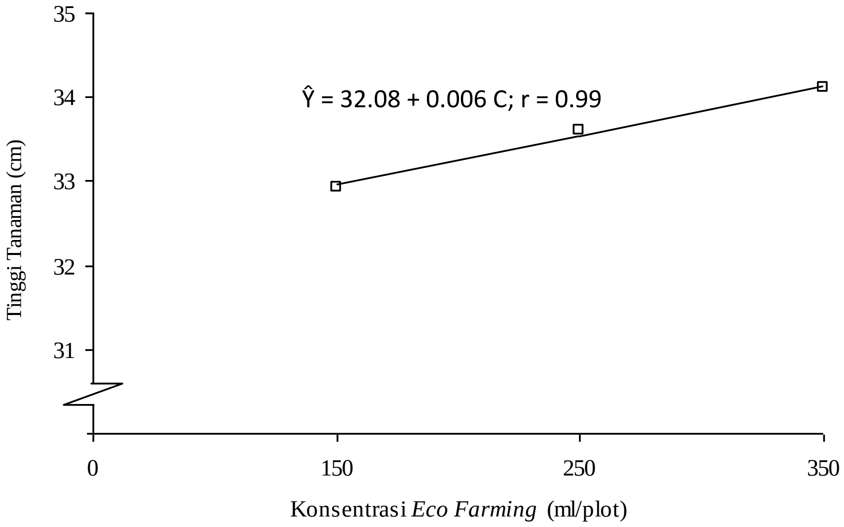

Figure 2. Effect of Eco Farming on the Height of Red Onion Plants 5 Weeks After Planting

Figure 2 shows that the higher the concentration of eco farming, the higher the height of the shallot plant, following a positive linear regression curve. Increasing the concentration of eco farming by 100 ml/plot can increase plant height growth by 0.6 cm.

2) Number of leaves (strands)

Data regarding the quantity of plant leaves at 2, 3, 4, and 5 MST resulting from cow dung and eco-farming interventions. The variance analysis indicates that cow dung treatment significantly influences the quantity of plant leaves at 2, 3, 4, and 5 months after sowing (MST). Eco farming treatment significantly influences the quantity of plant leaves at 3, 4, and 5 MST, but not at 2 MST. The interaction between the two treatments does not significantly affect the quantity of plant leaves. Table 3 displays the mean shallot leaf measurements at 2, 3, 4, and 5 MST.

Table 2. Average Number of Leaves (strands) of Shallot Plants in Cow Manure and Eco Farming Treatments at Ages 2, 3, 4, and 5 MST

Treatment	Number of leaves (blades)			
	2 MST	3 MST	4 MST	5 MST
P0	21.69b	27.67b	32.22b	36.00b
P1	23.02a	28.80a	33.31a	37.04ab
P2	23.49a	29.38a	33.93a	37.67a
P3	22.89a	28.87a	33.49a	37.82a

C1	22.40	28.13b	32.27b	35.83b
C2	22.80	28.80a	33.50a	37.72a
C3	23.12	29.10a	33.95a	37.85a
P0C1	20.53	26.53	30.93	34.60
P0C2	21.87	27.87	32.27	36.47
P0C3	22.67	28.60	33.47	36.93
P1C1	23.07	28.40	32.13	35.87
P1C2	22.93	28.93	33.80	37.67
P1C3	23.07	29.07	34.00	37.60
P2C1	23.60	29.27	33.40	36.40
P2C2	23.47	29.47	34.27	38.33
P2C3	23.40	29.40	34.13	38.27
P3C1	22.40	28.33	32.60	36.47
P3C2	22.93	28.93	33.67	38.40
P3C3	23.33	29.33	34.20	38.60

Description: Numbers followed by the same letter in the same column mean that they are not significantly different in the DMRT test at a 5% test level.

Table 3 indicates that in the treatment of cow dung at 2, 3, and 4 MST, the P2 treatment exhibited the largest leaf count, which was substantially different from P0, however not significantly different from P1 and P3. The P3 treatment had the highest leaf count at 5 MST, showing a substantial difference from P0, although no significant difference from P1 and P2. The quantity of leaves in the P2 treatment exhibited a substantial difference from P0, but not from P1. The quantity of leaves in the P1 treatment did not differ significantly from that in P0. Figure 3 illustrates the impact of cow manure on the leaf count of shallot plants at 5 MST.

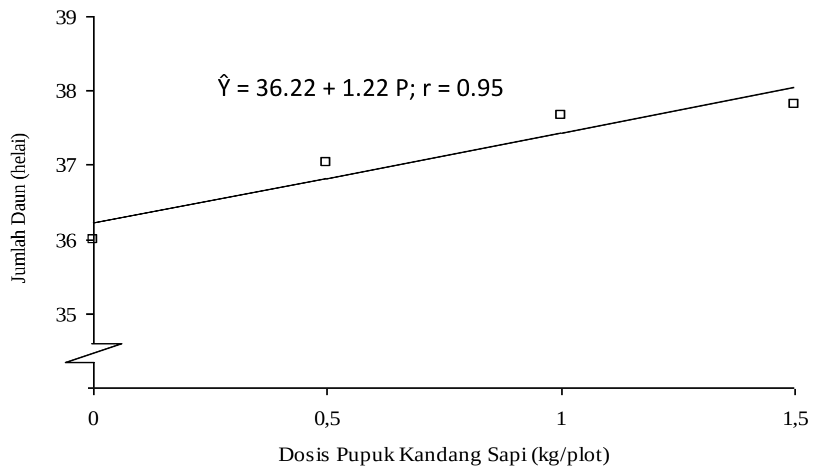

Figure 3. Effect of Cow Manure on the Number of Leaves of Red Onion Plants 5 Weeks After Planting

Figure 3 illustrates that an increase in cow dung dosage correlates with a bigger quantity of plant leaves, adhering to a positive linear regression trajectory. Augmenting the dosage of cow dung by 1 kg per plot can elevate the leaf count of plants by 1.22 strands. Table 2 indicates that in the eco farming treatment at ages 3, 4, and 5 MST, the C3 treatment exhibited the maximum quantity of shallot leaves, which was substantially different from C1 and C2. The quantity of plant leaves in the C2 treatment markedly contrasted with that in C1. The impact of eco farming on the quantity of shallot leaves at 5 MST is illustrated in Figure 4.

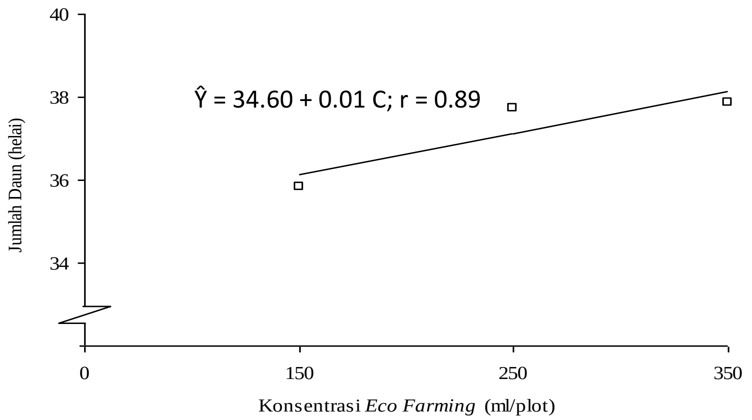

Figure 4. Effect of Eco Farming on the Number of Leaves in Red Onion Plants 5 Weeks After Planting

Figure 4 illustrates that an increase in eco farming concentration correlates positively with the number of leaves on shallot plants, adhering to a linear regression trend. Augmenting the concentration of eco farming by 100 ml each plot can elevate the amount of plant leaves by one strand.

3) Wet Weight of Bulbs per Sample (g)

Data regarding the wet weight of bulbs per sample resulting from cow dung and ecological farming treatments. The analysis of variance indicates that cow dung and eco-farming treatments significantly influence the wet weight of bulbs per sample. The interaction between the two treatments does not significantly affect the moist weight of bulbs per sample. Table 5 displays the mean wet weight of bulbs per shallot plant sample as affected by cow dung and eco-farming treatments.

Table 3. Average Wet Weight of Bulbs per Sample (g) in Cow Manure and Eco Farming Treatments

Treatment	C1	C2	C3	Average
P0	35.46	36.32	37.35	36.38b
P1	35.85	37.08	39.45	37.46a
P2	37.25	38.15	38.81	38.07a
P3	36.72	38.31	39.29	38.11a
Average	36.32c	37.47b	38.72a	

Description: Numbers followed by the same letter in the same column mean that they are not significantly different in the DMRT test at a 5% test level.

Table 3 indicates that in the cow manure treatment, the wet weight of tubers per sample was greatest in treatment P3, significantly differing from P0, but not significantly differing from P1 and P2. The moist weight of tubers per sample in treatments P2 and P1 significantly differed from that of P0. Figure 5 illustrates the impact of cow manure on the wet weight of tubers per sample.

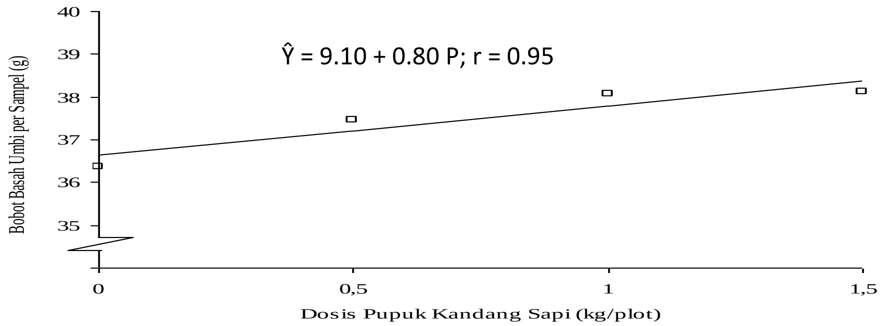

Figure 5. Effect of Cow Manure on Wet Weight of Bulbs per Sample

Figure 5 illustrates that an increase in the dosage of cow dung correlates with a rise in the wet weight of tubers per sample, according to a positive linear regression trend. Augmenting the dosage of cow dung by 1 kilogram per plot can enhance the wet weight of tubers per sample by 0.80 g. Table 3 indicates that the wet weight of tubers per sample in the eco-farming treatment was greatest in the C3 treatment, exhibiting a significant difference from C1 and C2. The wet weight of tubers per sample in the C2 treatment markedly differed from that in the C1 treatment. Figure 6 illustrates the impact of eco farming on the wet weight of tubers per sample.

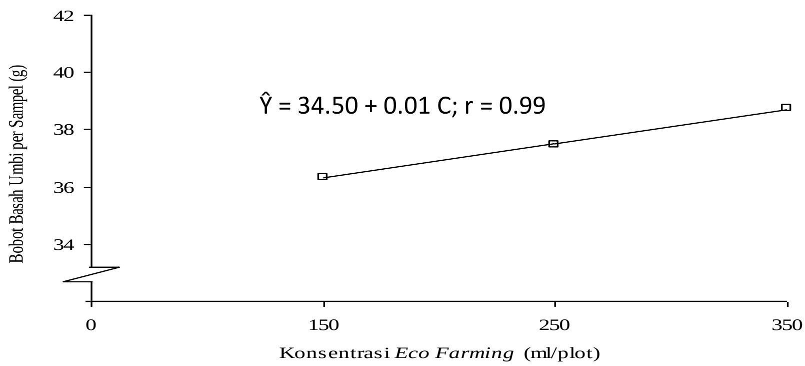

Figure 6. Effect of Eco Farming on Wet Weight of Tubers per Sample

Figure 6 illustrates that a rise in eco farming concentration correlates positively with the moist weight of tubers per sample, following a linear regression trend. Augmenting the concentration of eco farming by 100 ml per plot can enhance the wet weight of tubers per sample by 1 g.

4) Wet Weight of Bulbs per Plot (g)

Data regarding the wet weight of bulbs per plot resulting from cow dung and ecological farming treatments. The analysis of variance indicates that cow dung and eco-farming treatments significantly influence the wet weight of bulbs per plot. The interaction between the two treatments does not significantly affect the moist weight of bulbs per plot. Table 6 displays the average wet weight of shallot bulbs per plot as affected by cow dung and eco-farming treatments.

Table 4. Average Wet Weight of Bulbs per Plot (g) in Cow Manure and Eco Farming Treatments

Treatment	C1	C2	C3	Average
P0	291.57	332.50	341.20	321.76b
P1	318.77	352.17	355.93	342.29ab
P2	324.67	363.97	375.37	354.67a
P3	342.57	353.10	376.13	357.27a
Average	319.39b	350.43a	362.16a	

Description: Numbers followed by the same letter in the same column mean that they are not significantly different in the DMRT test at a 5% test level.

Table 4 indicates that in the cow manure treatment, the highest wet weight of tubers per plot occurred in treatment P3, which was significantly distinct from P0, but not significantly different from P1 and P2. The moist weight of tubers per plot under treatment P2 exhibited a significant difference from P0, but not from P1. The wet weight of tubers per plot in treatment P1 was not markedly different from that in P0. Figure 7 illustrates the impact of cow manure on the wet weight of tubers per plot.

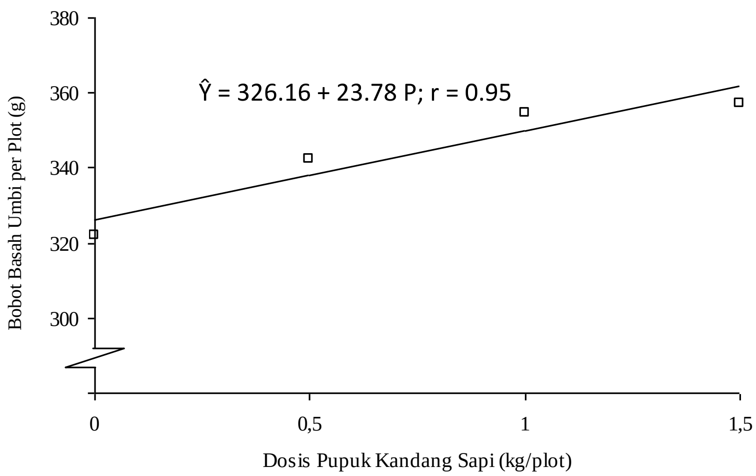

Figure 7. Effect of Cow Manure on Wet Weight of Bulbs per Plot

Figure 7 illustrates that an increase in cow manure dosage correlates with a rise in the moist weight of tubers per plot, according to a positive linear regression trend. Augmenting the dosage of cow dung by 1 kg per plot can enhance the wet weight of tubers per plot by 23.78 g. Table 6 indicates that the highest wet weight of tubers per plot in the eco-farming treatment occurred in the C3 treatment, which exhibited a significant difference from C1 but not from C2. The moist weight of tubers per plot in the C2 treatment exhibited a significant difference compared to the C1 treatment. Figure 10 illustrates the impact of eco farming on the wet weight of tubers per plot, indicating that an increase in eco farming concentration correlates with a rise in the wet weight of tubers per plot, following a positive linear regression trend. A 100 ml/plot augmentation in eco farming concentration can elevate the wet weight of tubers per plot by 1 g.

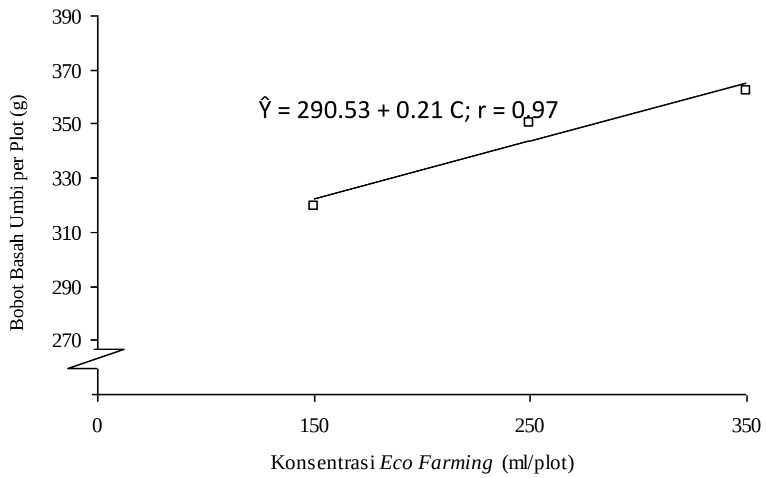

Figure 8. Effect of Eco Farming on Wet Weight of Tubers per Plot

Discussion

1) The Effect of Cow Manure on Growth and Production of Red Onion Plants (Allium ascalonicum L.)

The analysis of variance revealed that the application of cow manure significantly influenced plant height, leaf count, tuber quantity per clump, wet tuber weight per sample, wet tuber weight per plot, storage tuber weight per sample, and storage tuber weight per plot.

The research indicated that cow dung applied at a rate of 1.5 kg per plot yielded the tallest shallot plants, measuring 34.43 cm. Elevating the dosage of bovine dung led to enhanced plant height development. This fertilizer enhances soil organic matter and nutrient availability, hence promoting plant height and growth. Cow dung enhances the physical qualities of soil, resulting in improved texture, aggregation, water retention capacity, and cation exchange capacity, hence facilitating water availability for plant growth. Moreover, progressively loose soil conditions would enhance plant root development, hence augmenting nutrient absorption.The cow manure provision will give the soil more aeration and water absorption capacity, and nutrient availability will increase(Amri & Abdullah, 2021; Nasrullah et al., 2023; Putri, 2023).

The study showed that cow manure with a dose of 1.5 kg/plot produced 37.82 leaves and 37.82 strands. The provision of cow manure can increase soil fertility and both the physical and chemical properties of the soil. The provision of cow manure will help improve the physical fertility of the soil, increase water holding capacity, increase the content of macro and micro nutrients, and increase the activity of microorganisms. Biological activity in the soil is involved in the decomposition of organic matter. Soil microorganisms are most effective in decomposing organic matter at pH 6-7. Increasing the decomposition of soil organic matter will increase the availability of nutrients in the soil. The increasing supply of nutrients will increase photosynthesis in plants, which will be translocated in the formation of plant leaves, so that the number of leaves will increase(Saragih et al., 2021).

The study's results showed that the dose of cow manure with a dose of 1.5 kg/plot produced the number of tubers per clump of 10.27 cloves. This is because cow manure contains nutrients N, P, and K needed to form tubers. Nutrients, especially nitrogen, play an important role in photosynthesis, increasing photosynthesis to produce photosynthate, which will then be translocated in the formation of tubers. The more nutrients that are transported through water and stored by plants, the better the photosynthesis process will be because the main ingredients of photosynthesis have been fulfilled.(Khaliriu, 2020; Sugirno et al., 2021)If the photosynthesis process goes well, assimilate accumulation will increase for use in red onion bulbs.

The results showed that the dose of cow manure, with a dose of 1.5 kg/plot, produced a wet weight of tubers per sample and plot. This is because increasing cow manure will further increase the availability of soil nutrients and soil organic matter content, so that plants get a sufficient supply of nutrients and organic matter in the formation of tubers, producing more tubers. The size of the tubers produced is greater. Augmenting the quantity of leaves and the dimensions of tubers would further enhance the wet weight of tubers per sample and plot. Manure enhances soil structure by augmenting organic matter content and improving the soil's capacity to retain moisture. Organic content in bovine excrement can decrease soil compaction, hence enhancing root growth and nutrient absorption capabilities. Organic matter influences plant growth primarily by altering soil qualities and features.(Herawati et al., 2019; Wasis & Sandrasari, 2011).

2) The Effect of Eco Farming on the Growth and Production of Red Onion Plants (Allium ascalonicum L.)

The analysis of variance test results indicated that eco farming significantly influenced plant height, leaf count, tuber quantity per clump, wet tuber weight per sample, wet tuber weight per plot, storage weight of tubers per sample, and storage weight of tubers per plot.

The study results showed that eco farming with a concentration of 350 ml/plot produced the highest plants of 34.10 cm, and the number of leaves was 37.85 strands. Eco Farming can supply the nutrient needs of shallot plants. According to(Gumelar, 2015), the increase in plant height begins with the increase in shoots that are getting longer and continues with their development into leaves and stems. Eco farming can meet the 13 nutrient content needed by all types of plants. The thirteen contents are divided into three nutrient elements, namely: macro nutrients (N, P, K), secondary nutrients (S, Ca, Mg), micro nutrients (Cl, Mn, Fe, Cu, Zn, B, Mo). Eco farming is a concentrate composed of various important ingredients that are good for plant growth and have the potential to meet all the healthy nutrients for plants(Gamage et al., 2023).

The study results showed that eco farming with a concentration of 350 ml/plot can increase the number of bulbs per clump by 10.17 cloves. This is because the pEco farming fertilizers can provide the P element needed by shallot plants in optimal amounts when entering the generative phase. According to(Riono & Apriyanto, 2020), stated that the P element is an element that plays a vital role in the generative growth phase, namely the flowering process and tuber formation. The availability of soil nutrients greatly influences plant growth. The P element is beneficial for stimulating photosynthesis and accelerating plant growth, and the P nutrient element is necessary for increasing plant production.(Lizta, 2022; Tri Indra Sasongko, 2023)Phosphorus plays an important role in most enzyme reactions that depend on photophosphorylase. Therefore, phosphorus is part of the cell nucleus and is crucial in cell division. Thus, phosphorus can accelerate flowering and fruit ripening; it is also a component of fat and protein.

The study results showed that eco farming with a concentration of 350 ml/plot can increase the wet weight of tubers per sample and the wet weight of tubers per plot. This is due to the provision of eco-farming fertilizers, which can supply the nutrients plants need. This results in sufficient energy in the vegetative phase and encourages plants to undergo the generative phase.(Lizta, 2022), stated that plants' metabolism is determined by the availability of nutrients, especially sufficient N, P, and K. The availability of these nutrients and other factors directly affects plant production.

The study results showed that the provision of eco farming with a concentration of 350 ml/plot can increase the storage weight of tubers per sample by 28.24 g. Eco-farming fertilizer can supply the nutrients N, P, and K, primary macronutrients. If the plant's need for these nutrients is met, it will optimize the growth and production of peanut plants. Photosynthesis will be an important factor in plant growth and production. According to(Kantikowati & Khotimah, 2022), the assimilates resulting from photosynthesis will be used by plants for the growth process. When the growth phase is optimal, the plants will store assimilates to produce high yields.

3) The Effect of Interaction of Cow Manure and Eco Farming on the Production of Red Onion Plants (Allium ascolonicum L.)

The variance analysis test results indicated that the interaction between cow manure dosage and eco farming did not significantly affect plant height, leaf count, tuber wet weight per sample, or tuber wet weight per plot. This indicates that the application of cow manure and eco-farming fertilizers has not affected the pattern of plant physiological activity.According to(Sipayung et al., 2020), good plant growth can be achieved if the factors influencing growth are balanced and beneficial.

5. CONCLUSION AND SUGGESTIONS

Application of cow manure has a significant effect on plant height, number of leaves, wet weight of tubers per sample, wet weight of tubers per plot. The provision of eco farming has a significant effect on plant height, number of leaves, wet weight of tubers per sample, wet weight of tubers per plot. The interaction between the provision of cow manure and eco farming had no significant effect on plant height, number of leaves, wet weight of tubers per sample, wet weight of tubers per plot. **Suggestions:** Additional research is required to determine the optimal dosage of cow dung and eco-friendly liquid organic fertilizer for enhancing the development and yield of shallots. The application rate of cow dung is 1.5 kg per plot, while the concentration of eco farming solution is 350 ml each plot.

REFERENCE

Amri, A., & Abdullah, T. (2021). Respon Sifat Fisika Inceptisol Terhadap Pemberian Blotong dan Pupuk Kandang Sapi. *Jurnal Ilmiah Media Agrosains*, *7*(1), 23–32.

Barus, W. A., Risnawati, V., & Ahmad, Y. S. (2021). PEMANFAATAN DEBU VULKANIK SINABUNG UNTUK PERTUMBUHAN DAN PRODUKSI TANAMAN BAWANG MERAH (Allium ascolonicum) DALAM BEBERAPA DOSIS PUPUK KCL. *Jurnal Penelitian Bidang Ilmu Pertanian*, *19*(1), 47–62.

Cahyawati, A. N., Kusuma, L., Widiyawati, S., Lustyana, A. T., Putro, W. W., Setyanto, N. W., Maghdiyyah, Z. A., Kirana, A. Z., Fitri, A. M., & Maulida, A. S. (2022). Pemanfaatan sampah organik menjadi pupuk organik cair dengan pendekatan effective microorganisms yang berbasis sustainable manufacturing. *TEKAD Tek. Mengabdi*, *1*(1), 23–30.

Farabi, I., Zuraida, Z., & Jufri, Y. (2023). Kombinasi Kompos Trembesi dan Eco Farming Terhadap Serapan Hara N, P, K dan Pertumbuhan Jagung (Zea mays) pada Inceptisol. *Jurnal Ilmiah Mahasiswa Pertanian*, *8*(1), 389–397.

Gamage, A., Gangahagedara, R., Gamage, J., Jayasinghe, N., Kodikara, N., Suraweera, P., & Merah, O. (2023). Role of organic farming for achieving sustainability in agriculture. *Farming System*, *1*(1), 100005.

Garfansa, M. P., Iswahyudi, F. N. U., & Ramly, M. (2021). Pengaruh Aplikasi Pupuk Organik Cair dan ZPT Alami terhadap Pertumbuhan Tanaman Padi Salibu di Sawah Basah. *Agriprima: Journal of Applied Agricultural Sciences*, *5*(1), 18–24.

Gultom, F., Hernawaty, H., Brutu, H., & Karo-Karo, S. (2022). Pemanfaatan pupuk ekoenzim dalam meningkatkan pertumbuhan dan produksi tanaman bawang merah (Allium cepa L.). *Jurnal Darma Agung*, *30*(1), 142–159.

Gumelar, A. I. (2015). Pengaruh aplikasi pupuk NPK 16: 16: 16 terhadap pertumbuhan tanaman jeruk purut (Citrus hystrix) dari hasil sambung pucuk. *Jurnal Agrorektan*, *2*(1), 21.

Hariyadi, H., Winarti, S., & Basuki, B. (2021). Kompos dan pupuk organik cair untuk pertumbuhan dan hasil cabai rawit (Capsicum frutescens) di tanah gambut. *Journal of Environment and Management*, *2*(1), 61–70.

Hasnelly, H., & Gatot, E. (2020). Pengaruh Pemberian Pupuk Kompos Kulit Kopi Terhadap Pertumbuhan Dan Hasil Tanaman Bawang Merah (Allium ascalonicum L) Varietas Lembah Palu. *Jurnal Sains Agro*, *5*(2).

Herawati, M., Soekamto, A. F., & Fahrizal, A. (2019). Upaya peningkatan kesuburan tanah pada lahan kering di Kelurahan Aimas Distrik Aimas Kabupaten Sorong. *Abdimas: Papua Journal of Community Service*, *1*(2), 14–23.

Iswahyudi, I., & Juanda, B. R. (2024). PENGARUH DOSIS Trichoderma harzianum DAN VARIETAS BAWANG MERAH UNTUK MENGENDALIKAN PENYAKIT MOLER (Fusarium oxysporum) DAN PRODUKSI TANAMAN BAWANG MERAH (Allium ascalonicum L.). *Jurnal Ilmu Pertanian Tirtayasa*, *6*(2).

Kantikowati, E., & Khotimah, I. H. (2022). Pertumbuhan dan hasil jagung manis (zea mays saccharata sturt) varietas paragon akibat Perlakuan jarak tanam dan jumlah benih. *AGRO TATANEN| Jurnal Ilmiah Pertanian*, *4*(2).

Khaliriu, F. (2020). *Pengaruh pupuk organik cair sabut kelapa dan NPK 16: 16: 16 terhadap pertumbuhan dan produksi tanaman bawang merah (Allium ascalonicum L.)*. Universitas Islam Riau.

Lizta, R. P. (2022). *Pengaruh Konsentrasi Pupuk Eco Farming Terhadap Pertumbuhan dan*

Hasil Beberapa Varietas Kacang Tanah (Arachis hypogaea L.). Universitas Islam Riau.

Louto, F. F., & Shamdas, G. B. N. (2022). Respon Tanaman Jagung Manis (Zea mays sacharata) Akibat Pupuk Organik Eco Farming dan Pemanfaatannya Sebagai Media Pembelajaran. *Journal of Biology Science and Education*, *10*(2), 38–49.

Nasrullah, N., Ibrahim, B., & Robbo, A. (2023). Pengaruh Pemberian Berbagai Macam Pupuk Organik Padat Terhadap Kemampuan Tanah Menyimpan Air. *AGrotekMAS Jurnal Indonesia: Jurnal Ilmu Peranian*, *4*(2), 200–205.

Pardede, R. Z., & Fathurrahman, F. (2024). PENGARUH PUPUK ECOFARMING DAN NPK MUTIARA TERHADAP PERTUMBUHAN BIBIT KELAPA SAWIT DI MAIN NURSERY PADA MEDIA GAMBUT. *DINAMIKA PERTANIAN*, *40*(1), 13–28.

Permatasari, D. F. (2021). *Uji aplikasi pupuk organik cair dengan berbagai macam bahan dan kosentrasi terhadap pertumbuhan dan hasil tanaman bawang merah (Allium ascalonicum L.)*. Wijaya Kusuma Surabaya University.

Prasetyo, A., Winarti, S., Zubaidah, S., Sulistiyanto, Y., & Chotimah, H. E. N. C. (2022). PENGARUH PUPUK ORGANIK CAIR DAN PUPUK MAJEMUK NPK TERHADAP PERTUMBUHAN SETEK BATANG CINCAU HIJAU: Effect of Liquid Organic Fertilizer and NPK Compound Fertilizer On The Growth of Green Grass Cincau (Premna oblongifolia Merr) Stem Cuttings in Peat Soil. *AgriPeat*, *23*(2), 82–95.

Pratiwi, D. A. (2021). *Budidaya Bawang Merah Varietas Bauji Dengan Metode Kelambu Kasa Di P4s Santosa Jaya Kabupaten Nganjuk Laporan Praktek Kerja Lapang*.

Putri, A. B. (2023). *PENGARUH PEMBERIAN BERBAGAI JENIS PUPUK KANDANG TERHADAP PERTUMBUHAN BIBIT TANAMAN KOPI ROBUSTA (Coffea canephora L) PADA TANAH ULTISOL DI POLYBAG*. Universitas BATANGHARI Jambi.

Riono, Y., & Apriyanto, M. (2020). Pemanfaatan abu sekam padi dalam inovasi pemupukan kacang hijau (Vigna Radiate L) di lahan gambut. *Selodang Mayang: Jurnal Ilmiah Badan Perencanaan Pembangunan Daerah Kabupaten Indragiri Hilir*, *6*(2), 60.

Rizal, M., Ramli, R., Parawansa, I. N. R., Pannyiwi, T., & Purwanto, B. (2024). Efektivitas Pupuk Organik Eco Farming terhadap Pertumbuhan dan Produksi Tanaman Padi (Oryza sativa L.): Effectiveness Of Eco Farming Organic Fertilizer On The Growth And Production Of Rice (Oryza sativa L.). *Jurnal Agrisistem*, *20*(1), 31–36.

Rodrian, Y. (2022). *PENGARUH PUPUK KANDANG AYAM TERHADAP PERTUMBUHAN DAN HASIL TANAMAN BAWANG MERAH (Allium ascalonicum L)*. Universitas Mahasaraswati Denpasar.

Sanapiah, S., Yuntawati, Y., Kurniawan, A., Juliangkary, E., & Pujilestari, P. (2021). Penyuluhan dan pendampingan penggunaan pupuk organik eco farming pada kelompok Tani Sinar Harapan Dusun Paok Kambut Desa Telagawaru Kecamatan labuapi. *SELAPARANG: Jurnal Pengabdian Masyarakat Berkemajuan*, *5*(1), 688–694.

Saragih, M. K., Panataria, L. R., & Nainggolan, M. (2021). Respon pertumbuhan dan produksi bawang merah (Allium Ascalinicum L.) terhadap pemberian biochar dan pupuk kandang ayam di tanah Ultisol secara vertikultur. *Jurnal METHODAGRO*, *7*(2), 41–46.

Sipayung, M., Matondang, T., & Nababan, V. T. (2020). Pengaruh Pemberian Dosis dan Metode Aplikasi Pupuk Npk terhadap Pertumbuhan dan Produksi Tanaman Oyong (Luffa Acutangula L.): The Effect Of Giving Dosage And Application Methods Of Npk Fertilizer On The Growth And Production Of Oyong Plant (Luffa Acutangu. *Rhizobia*, *2*(1), 344529.

Sugirno, O., Indrawanis, E., & Ezward, C. (2021). Konsentrasi Pemberian Pupuk Organik Cair Fortune Terhadap Pertumbuhan Dan Produksi Tanaman Bawang Merah (Allium cepa L). *GREEN SWARNADWIPA: JURNAL PENGEMBANGAN ILMU PERTANIAN*, *10*(2), 225–233.

Sulardi, M. (2020). Efektivitas pemberian pupuk kandang sapi dan POC enceng gondok terhadap pertumbuhan dan produksi bawang merah (Allium ascalonicum L.). *Jasa Padi*, *5*(1), 52–56.

Sulistyaningsih, C. R. (2019). Pengolahan Limbah Jerami Padi dengan Limbah Jamu Menjadi Pupuk Organik Plus. *Jurnal Surya Masyarakat*, *2*(1), 58–68.

Taga, S., Naisanu, J., & Raga, H. A. (2024). Pengaruh Pupuk Pelengkap Cair (PPC) Verti Grow dan Pupuk Kandang Sapi Terhadap Pertumbuhan Dan Produksi Tanaman Bawang Merah (Allium cepa L.). *Jurnal Moringa Agro*, *1*(01), 26–33.

Tri Indra Sasongko, Z. (2023). Pengaruh Abu Boiler dan Pupuk TSP Terhadap Pertumbuhan Serta Produksi Tanaman Kacang Hijau (Vigna Radiata L.). *Jurnal Agroteknologi Agribisnis Dan Akuakultur*, *3*(2), 146–160.

Wasis, B., & Sandrasari, A. (2011). Pengaruh pemberian pupuk kompos terhadap pertumbuhan semai mahoni (Swietenia macrophylla King.) pada media tanah bekas tambang emas (Tailing). *Jurnal Silvikultur Tropika*, *3*(1), 109–112.