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The Influence of Liquid Organic Fertilizer from Pineapple Peel Waste and Chicken Manure Compost on the Growth and Production of Purple Eggplant (*Solanum melongena*)

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Abstract

Purple eggplant (Solanum melongena L.) is a widely recognized food source among all segments of society. It has become one of the most favored dishes across various groups. The demand for purple eggplant continues to rise; however, this increase in demand is not accompanied by a corresponding rise in production levels. The Factorial Randomized Block Design with two factors and three replications is used in this study. The observation parameters in this study include stem diameter (mm), plant height (cm), fruit length (cm), number of fruits per planting (fruits), number of fruits per plot (fruits), weight of fruits per planting (g), and weight of fruits per plot. The study's findings demonstrated that using fertilizer made from chicken manure significantly impacted the following parameters: fruit length (cm) in the K3 treatment were 20.09 cm and the S3 treatment of pineaple peel waste were 18.83 cm, fruit weight per plant (g) in the K3 treatment were 782.11 g, and S3 treatment were 735.86 g and had no discernible impact on the following parameters: fruit weight per plot (g) in the K3 treatment of chicken manure fertiliser were 781.27 g and the S3 treatment of pineapple peel waste were 7.14 g; number of fruits per plant (fruit) in the K3 treatment of chicken manure fertiliser were 7.46 fruit and the S3 treatment of pineapple skin waste were 7.18 fruit. There is no effect of pineapple peel waste LOF on all parameters.

Keywords: *Chicken Manure Fertilizer; Organic Fertilizer; Pineapple Peel Waste; Purple Eggplant; Solanum melongena*

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INTRODUCTION

The eggplant plant (*Solanum melongena* L.) is one of the shrub plants that has many health benefits. This plant contains phenolic acid that acts as anti-diabetic, an anti-inflammatory, anti-obesity, and is good for heart health. In addition, eggplant is rich in anthocyanin compounds that are beneficial for addressing nerve issues, cardiovascular disorders, and diabetes (Naeem & Ugur, 2019). Based on the research (Shen et al., 2017) The eggplant contains glycoalkaloid compounds that act as anti-cancer agents. Glycoalkaloids can reduce lung cancer cells and have anti-inflammatory functions as well as the ability to lower cholesterol. The fiber found in eggplant is beneficial for digestion. Eggplant is rich in Copper, potassium, manganese, and magnesium are essential for healthy bones.

The eggplant *(Solanum melongena L.)* Eggplant is one of the food sources that is well known by all levels of society. It has become one of the most popular dishes, and it is not difficult to purchase as it is available in markets and supermarkets. In addition to its delicious taste, eggplant can also be processed into various types of dishes. In fact, the method of processing it is considered very easy (Evanita et al., 2014).

The productivity of eggplant crops in Indonesia from 1997 to 2012 was 518,827 tons/ha, experiencing an increase of 1.43 %. National eggplant production tends to increase each year; however, eggplant production in Indonesia remains low, contributing only 1 % of the world's demand. This is due to the limited area of eggplant cultivation and the fact that the cultivation practices are still marginal and not yet intensive (Simatupang, 2014).

The domestic market is a potential market for the marketing of fruits and vegetables. The commodities of vegetables and fruits are indeed directed to invigorate the domestic market. However, the market certainly requires the necessary supply of goods, both in terms of quantity and specific quality. For this reason, a good and proper cultivation pattern is needed. So that the supply of goods meets the expectations of many related parties, including farmers, middlemen, traders, wholesalers, and consumers in general. The demand for purple eggplant continues to increase, but this increase in demand is not accompanied by an increase in production quantity. One of the reasons is the still low productivity of purple eggplant (Anastasia & Hanang, 2014). The increase in the production of purple eggplant can be enhanced through organic fertilization. Applying organic fertilizers can enhance the soil's structure and water-absorbing capacity, enhance the soil's living conditions and act as a source of plant nutrients. Additionally, the provision of organic fertilizers are essential for the development of green leaves and can promote general growth, especially in branches, stems, and leaves (Wuli et al., 2021). Organic fertilizers are the outcome of organic materials' decomposition that are broken down by microbes, ultimately providing The critical nutrients needed for the growth and development of plants.

One kind of fertilizer that comes in liquid form is called liquid organic fertilizer (LOF), obtained by dissolving organic materials that can be used as liquid organic fertilizer. Liquid fertilizer contains essential nutrients required for the growth, development, and health of plants. The nutrients include potassium (K), which increases the plant's resilience to pest and disease attacks, phosphorus (P), which promotes the growth of roots, fruits, and seeds, and nitrogen (N), which is necessary

for the growth of shoots, stems, and leaves. Liquid fertilizer has advantages compared to other natural fertilizers (manure, green fertilizer, and compost) in that the nutrients contained in liquid organic fertilizer are absorbed by plants more quickly (Yuanita et al., 2016). Based on the results of research by Delfiana et al., (2019) that the application of MOL banana and papaya peels with a concentration of 75 cc/liter produces good growth on the growth of cocoa seedlings. Based on Jamidi et al., (2021) research that When using pineapple peel waste as a liquid organic fertilizer, cocoa seedlings typically grow better at a concentration of 75 ml/L water.

Chicken manure is waste produced from poultry farming that can pose environmental problems. To reduce this waste, chicken manure can be utilized as fertilizer. The resulting fertilizer is called compost, which is prepared through a fermentation process to accelerate decomposition by various types of bacteria, using EM4 starter. The produced compost is analyzed for nutrient content of N, organic C, and C/N. The observations made by the researchers found that the fermented chicken manure fertilizer is widely used for various types of plants, one of which is eggplant (Kahar et al., 2016). The compost fertilizer has characteristics, including low nutrient content, slow availability of nutrients, and provides nutrients in limited quantities. However, compost fertilizer contains many microorganisms that help in providing nutrients quickly because it contains nutrients that are already available and ready to be absorbed by plants, but it does not have a positive effect on the soil. Therefore, observations were made on the growth and production of eggplant (Pramudika et al., 2014). The use of chicken manure 20 tons/ha significantly affects the growth and production of melon plants (Triyanti, 2018).

This research was conducted in Kampung Darul Amin, Jalan Berdikari Dusun 3 No. 200 Buluhnipes, Sampe Cita, Kecamatan Kutalimbaru, Kabupaten Deli Serdang. The research was carried out in July. The materials used in this research are purple eggplant seeds, chicken manure compost, and LOF from pineapple skin, tobacco, and garlic. The tools used in this research are a hoe, machete, watering can, bucket, sprayer, measuring tape, scale, plywood, marker, paper, pen, and wood.

METHOD

This research was conducted in Kampung Darul Amin, Jalan Berdikari Dusun 3 No. 200 Buluhnipes, Sampe Cita, Kutalimbaru Sub District, Deli Serdang Regions. The research was carried out in July 2024. The materials used in this research are purple eggplant seeds, chicken manure compost, and LOF from pineapple skin, tobacco, and garlic. The tools used in this research are a hoe, machete, watering can, bucket, sprayer, measuring tape, scale, plywood, marker, paper, pen, and wood. This research utilizes a Factorial Randomized Block Design (FRBD) with 2 factors and 3 replications. The first factor is chicken manure; K0 = 0 kg/plot (without treatment), K1 = 1 kg/plot, K2 = 2 kg/plot, K3 = 3 kg/plot, and the second factor is LOF from pineapple peel waste; S0 = 0 ml/liter of water/plot, S1 = 250 ml/liter of water/plot, S2 = 500 ml/liter of water/plot, S3 = 750 ml/liter of water/plot. The observation parameters in this study are plant height (cm), stem diameter (mm), fruit length (cm),

number of fruits per planting (fruits), number of fruits per plot (fruits), weight of fruits per planting (g), and weight of fruits per plot.

Procedure of Research

Production of Liquid Organic Fertilizer (LOF) from Pineapple Peel Waste

The main materials for producing liquid organic fertilizer from pineapple peel waste amounting to 10 kg should be cut first to reduce the size of the materials and to accelerate the fermentation process. The activator solution is prepared by mixing 2 liters of water, 500 ml of molasses, and 500 ml of EM4. The prepared materials are then mixed with the activator solution and stirred until homogeneous. Once all the materials are evenly mixed, they are transferred into a container and covered. The fermentation process is allowed to proceed for approximately 7 days. After 14 days (2 weeks), the production of liquid organic fertilizer can be harvested (Kusumadewi et al., 2020).

The Production of Chicken Manure Compost

Requires the preparation of necessary tools and materials such as: plastic tarpaulin, hoe, 50 kg of chicken manure, 10 kg of rice husk, 0.5 L of EM4, 1 L of molasses, and water. Dissolve EM4 and molasses in 5 liters of water, then let it sit for 6 hours. Place the rice husk on top of the chicken manure. Then, mix the rice husk and chicken manure evenly, and pour the EM4 solution over it. Once everything is well mixed, cover it with plastic. Turn it over three times at weekly intervals. The composting process is considered successful when the compost turns dark brown, has no pungent odor, and has a crumbly texture like soil. This composting process requires a minimum of 14 days.

Seedling

The seeding is carried out using a medium composed of soil, rice husk charcoal, and compost. After the plants are approximately 2 weeks old from sowing, the seedlings usually grow to a height of 5 cm. At this age, transfer the seedlings to small polybags or pots that already contain the same medium. At the age of 1-1.5 months after sowing (at least 4 leaves have emerged), the seedlings from the seeding process are ready to be transplanted to larger land or polybags.

Land Preparation

The land used for research must be cleared of weeds that grow in the area. Conduct soil processing by tilling to make the soil loose and easy to plant.

Plot Preparation

Create a total of 16 plots for this research, each measuring 100 cm in length, 100 cm in width, and 30 cm in height, with a distance of 30 cm between plots, a planting distance of 60 x 60 cm, and a distance of 50 cm between repetitions. A total

of 48 plots are required, consisting of 3 repetitions, with each repetition containing 16 experimental plots.

The Application of Chicken Manure

Fertilizer is done by directly placing it on the soil surface and then turning it over using a tool to expedite its integration into the soil, with the application occurring one week prior to planting.

The Application of LOF from Pineapple Peel Waste

Application LOF from pineapple peel waste is conducted once a week, starting from the third week for a duration of five weeks. The purpose is to promote the growth, development, and health of the plants.

RESULT AND DISCUSSION

The height of Eggplant (cm)

The analysis of variance on the height of eggplant plants at 3 WAP, 4 WAP, and 5 WAP indicates that the treatment of chicken manure has a significant effect at 3 WAP and 5 WAP, but does not affect the treatment of LOF pineapple peel waste and the interaction of both. The average height of the eggplant plants can be seen in Table 1. Table 1 explains that the highest plant height 283uet o the application of chicken manure fertilizer at the age of 3 WAP is treatment K3 = 3 kg/plot at 9.99 cm, and the lowest is treatment K0 = 0 kg/plot at 7.75 cm. At the age of 4 MST, the highest plant height is K3 = 3 kg/plot at 16.96 cm, and the lowest is treatment K0 = 0 kg/plot at 15.15 cm. At the age of 5 WAP, the highest plant height is K3 = 3 kg/plot at 34.65 cm, and the lowest is K0 = 0 kg/plot at 30.11 cm.

Table 1. Height of Purple Eggplant Plants at 3, 4 and 5 Week After Planting (WAP).

Treatment	Plant Height (cm)		
	3 WAP	**4 WAP**	**5 WAP**
Chicken Manure			
K0 = 0 kg/plot	7,75 Ba	15,15 Aa	30,11 Ba
K1 = 1 kg/plot	8,28 Ba	15, 28 Aa	30,31 Ba
K2 = 2 kg/plot	8,37 Ba	15,84 Aa	31,58 Aa
K3 = 3 kg/plot	9,99 Aa	16,96 Aa	34, 65 Aa
LOF Pineapple Peel Waste			
S0 = 0 ml/l of water/plot	7,99 Aa	15,29 Aa	30,11 Aa
S1 = 250 ml/l of water /plot	8,44 Aa	15,63 Aa	31,32 Aa
S2 = 500 ml/l of water /plot	8,67 Aa	15,95 Aa	31,83 Aa
S3 = 750 ml/l of water plot	9,19 Aa	16,35 Aa	33,40 Aa

Note: A significant difference at the 5% level (lowercase letters) and a highly significant difference at the 1% level (uppercase letters) are indicated by numbers in the same column followed by different letters.

Table 1 also explains that the highest plant height 284uet o the application of LOF pineapple peel waste at the age of 3 WAP is S3 = 750 ml/liter of water/plot at 9.19 cm and the lowest in the treatment S0 = 0 ml/liter of water/plot at 7.99 cm, at the age of 4 WAP the highest plant height is S3 = 750 ml/liter of water/plot at 16.35 cm and the lowest in the treatment S0 = 0 ml/liter of water/plot at 15.29 cm, and at the age of 5 WAP the highest plant height is S3 = 750 ml/liter of water/plot at 33.40 cm and the lowest in the treatment S0 = 0 ml/liter of water/plot at 30.11 cm.

Diameter of the rod (mm)

The results of the variance analysis on the stem diameter of eggplant plants at 3 WAP, 4 WAP, and 5 WAP indicate that the treatment of chicken manure and LOF Pineapple Skin Waste has no significant effect. The average stem diameter of the eggplant plants can be seen in Table 2.

Table 2. The diameter of the stem of the purple eggplant plant at 3, 4 and 5 Week After Planting (WAP).

Treatment	Diameter of the Rod (mm)		
	3 MST	4 MST	5 MST
Chicken Manure			
K0 = 0 kg/plot	4,17 Aa	6,63 Aa	7,04 Aa
K1 = 1 kg/plot	4,36 Aa	6,64 Aa	7,11 Aa
K2 = 2 kg/plot	4,27 Aa	6,66 Aa	7,16 Aa
K3 = 3 kg/plot	4,31 Aa	6,75 Aa	7,25 Aa
LOF Pineapple Peel Waste			
S0 = 0 ml/l of water/plot	4,20 Aa	6,61 Aa	7,11 Aa
S1 = 250 ml/l of water /plot	4,25 Aa	6,69 Aa	7,11 Aa
S2 = 500 ml/l of water /plot	4,26 Aa	6,64 Aa	7,14 Aa
S3 = 750 ml/l of water plot	4,40 Aa	6,73 Aa	7,19 Aa

Note: A significant difference at the 5% level (lowercase letters) and a highly significant difference at the 1% level (uppercase letters) are indicated by numbers in the same column followed by different letters.

Table 2 explains that the highest plant height 284uet o the application of chicken manure fertilizer at the age of 3 WAP is treatment K1 = 3 kg/plot at 4.36 mm, and the lowest is treatment K0 = 0 kg/plot at 4.17 mm. At the age of 4 WAP, the highest plant height is K3 = 3 kg/plot at 6.75 mm, and the lowest is treatment K0 = 0 kg/plot at 6.63 mm. At the age of 5 WAP, the highest plant height is K3 = 3 kg/plot at 7.25 mm, and the lowest is K0 = 0 kg/plot at 7.04 mm.

Table 2 also explains that the highest plant height 284uet o the application of LOF pineapple peel waste at the age of 3 WAP is S3 = 750 ml/liter of water/plot at 4.40 mm, and the lowest is in the treatment S0 = 0 ml/liter of water/plot at 4.20 mm. At the age of 4 WAP, the highest plant height is S3 = 750 ml/liter of water/plot at 6.73 mm, and the lowest in the treatment S0 = 0 ml/liter of water/plot at 6.61 mm. At the age of 5 WAP, the highest plant height is S3 = 750 ml/liter of water/plot at 7.19 mm, and the lowest in the treatment S0 = 0 ml/liter of water/plot at 7.11 mm.

Fruit Length (cm)

The results of the variance analysis on the length of eggplant fruit indicate that the treatment of chicken manure fertilizer has a significant effect, while the LOF of pineapple peel waste does not have a significant effect. The average length of the eggplant fruit can be seen in Table 3. Table 3 explains that the highest fruit length resulting from the application of chicken manure fertilizer, namely K3 = 3 kg/plot, is 20.09 fruits, while the lowest, K0 = 0 kg/plot, is 17.18 fruits. Table 3 also explains that the highest fruit length resulting from the application of pineapple peel liquid fertilizer, namely S3 = 750 ml/liter of water/plot, is 18.83 fruits, while the lowest, S0 = 0 ml/liter of water/plot, is 17.90 fruits.

Table 3. Length of Fruit (cm) of Purple Eggplant Plant

Treatment	Fruit Lenght (cm)
Chicken Manure	
K0 = 0 kg/plot	17,18 Ba
K1 = 1 kg/plot	17,65 Ba
K2 = 2 kg/plot	18,24 abA
K3 = 3 kg/plot	20,09 Aa
LOF Pineapple Peel Waste	
S0 = 0 ml/l of water/plot	17,90 Aa
S1 = 250 ml/l of water /plot	18,16 aA
S2 = 500 ml/l of water /plot	18,26 aA
S3 = 750 ml/l of water plot	18,83 aA

Note: A significant difference at the 5% level (lowercase letters) and a highly significant difference at the 1% level (uppercase letters) are indicated by numbers in the same column followed by different letters.

The cause of the ineffectiveness of the pineapple peel waste LOF may occur due to the use of liquid organic fertilizer from pineapple peels in this study not being ready for application to plants. The factors affecting the quality of liquid organic fertilizer include the C/N ratio of the material, material composition, material size, moisture, temperature, acidity (pH), number of microorganisms, color, and odor (Rasyid et al., 2020).

Total of Fruit Crops (fruit)

The results of the analysis of variance on the number of eggplant fruits indicate that the treatment of chicken manure and LOF from pineapple peel waste has no significant effect. The average number of eggplant fruits can be seen in Table 4. Table 4 explains that the highest number of fruits from the planting was due to the application of chicken manure fertilizer at harvest age 1, which was treatment K3 = 3 kg/plot amounting to 4.07 fruits, and the lowest was in treatment K0 = 0 kg/plot amounting to 3.74 fruits. At harvest 2, the highest number of fruits from the planting was K3 = 3 kg/plot amounting to 7.56 fruits, and the lowest in treatment K0 = 0 kg/plot amounting to 6.61 fruits. At harvest 3, the highest number of fruits from the planting

was K3 = 3 kg/plot amounting to 7.64 fruits, and the lowest was K0 = 0 kg/plot amounting to 6.85 fruits. At harvest 4, the highest number of fruits from the planting was K3 = 3 kg/plot amounting to 7.46 fruits, and the lowest was K0 = 0 kg/plot amounting to 6.60 fruits.

Table 4 also explains that the highest number of planted fruits due to the application of LOF of pineapple peel waste at harvest age 1 is S3 treatment = 750 ml/liter of water/plot of 4.23 fruits and the lowest in the S0 treatment = 0 ml/liter of water/plot of 3.77 fruits, in harvest 2 the highest number of planted fruits is S3 = 750 ml/liter of water/plot of 7.00 fruits and the lowest in the treatment of S0 = 0 ml/liter of water/plot of 6.53 fruits, harvested 3 of the highest number of crop fruits, namely S3 = 750 ml/liter of water/plot of 7.32 fruits and the lowest, namely S0 = 0 ml/liter of water/plot of 7.32 fruits, harvest 4 of the highest number of crop fruits, namely S3 = 750 ml/liter of water/plot of 7.18 fruits and the lowest, namely S0 = 0 ml/liter of water/plot of 6.66 pieces.

Table 4. The total number of fruits harvested from the purple eggplant plants in harvests 1, 2, 3, and 4.

Treatment	Total of Fruit Crops (Fruits)			
	Harvest 1	**Harvest 2**	**Harvest 3**	**Harvest 4**
Chicken Manure				
K0 = 0 kg/plot	3,74 aA	6,61 aA	6,85 aA	6,60 aA
K1 = 1 kg/plot	3,81 aA	6,96 aA	7,17 aA	6,91 aA
K2 = 2 kg/plot	3,92 aA	6,50 aA	6,92 aA	6,93 aA
K3 = 3 kg/plot	4,07 aA	7,56 aA	7,64 aA	7,46 aA
LOF Pineapple Peel Waste				
S0 = 0 ml/l of water/plot	3,77 aA	6,53 aA	6,81 aA	6,66 aA
S1 = 250 ml/l of water /plot	4,08 aA	7,30 aA	7,34 aA	6,93 aA
S2 = 500 ml/l of water /plot	4,09 aA	6,81 aA	7,08 aA	7,13 aA
S3 = 750 ml/l of water plot	4,23 aA	7,00 aA	7,32 aA	7,18 aA

Note: A significant difference at the 5% level (lowercase letters) and a highly significant difference at the 1% level (uppercase letters) are indicated by numbers in the same column followed by different letters

Total of Fruits Per Plot (Fruits)

The results of the variance analysis on the number of fruits per plot of eggplant plants indicate that the treatment of chicken manure and LOF from pineapple peel waste did not have a significant effect. The average number of fruits per plot of eggplant plants can be seen in Table 5. Table 5 explains that the highest number of fruits per plot due to the application of chicken manure fertilizer at harvest age 1 is treatment K3 = 3 kg/plot with 7.10 fruits, and the lowest is treatment K0 = 0 kg/plot with 5.94 fruits. At harvest 2, the highest number of fruits per plot is K3 = 3 kg/plot with 8.04 fruits, and the lowest is treatment K0 = 0 kg/plot with 7.54 fruits. At harvest 3, the highest number of fruits per plot is K3 = 3 kg/plot with 7.64 fruits, and the lowest is K0 = 0 kg/plot with 6.85 fruits. At harvest 4, the highest number of fruits per plot is K3 = 3 kg/plot with 7.33 fruits, and the lowest is K0 = 0 kg/plot with 6.61 fruits.

Table 5. Total Number of Fruits Per Plot (Fruits) of Purple Eggplant Plants at Harvests 1, 2, 3, and 4

Treatment	Total of Fruits Per Plot (Fruits)			
	Harvest 1	Harvest 2	Harvest 3	Harvest 4
Chicken Manure				
K0 = 0 kg/plot	5,94 ba	7,54 aA	6,85 aA	6,61 aA
K1 = 1 kg/plot	6,04 abA	7,62 aA	6,91 aA	6,92 aA
K2 = 2 kg/plot	6,19 abA	7,11 aA	7,17 aA	7,17 aA
K3 = 3 kg/plot	7,10 aA	8,04 aA	7,64 aA	7,33 aA
LOF Pineapple Peel Waste				
S0 = 0 ml/1 of water/plot	6,13 aA	7,27 aA	6,81 aA	6,79 aA
S1 = 250 ml/1 of water /plot	6,29 aA	8,08 aA	7,08 aA	6,94 aA
S2 = 500 ml/1 of water /plot	6,41 aA	7,47 aA	7,33 aA	7,11 aA
S3 = 750 ml/1 of water plot	6,44 aA	7,48 aA	7,34 aA	7,19 aA

Note: A significant difference at the 5% level (lowercase letters) and a highly significant difference at the 1% level (uppercase letters) are indicated by numbers in the same column followed by different letters.

Table 5 also explains that the highest number of fruits per plot resulting from the application of LOF pineapple peel waste at harvest age 1 is treatment S3 = 750 ml/liter of water/plot amounting to 6.44 fruits, and the lowest is in treatment S0 = 0 ml/liter of water/plot amounting to 6.13 fruits. At harvest 2, the highest number of fruits per plot is S3 = 750 ml/liter of water/plot amounting to 7.48 fruits, and the lowest in treatment S0 = 0 ml/liter of water/plot amounting to 7.27 fruits. At harvest 3, the highest number of fruits per plot is S3 = 750 ml/liter of water/plot amounting to 7.34 fruits, and the lowest is S0 = 0 ml/liter of water/plot amounting to 6.81 fruits. At harvest 4, the highest number of fruits per plot is S3 = 750 ml/liter of water/plot amounting to 7.19 fruits, and the lowest is S0 = 0 ml/liter of water/plot amounting to 6.79 fruits.

Fruit Crop Report (g)

The results of the variance analysis on the weight of the eggplant crop indicate that the treatment of chicken manure has a significant effect, while the LOF Pineapple Skin Waste does not have a significant effect. The average weight of the eggplant crop can be seen in Table 6. Table 6 explains that the highest fruit weight of the plants due to the application of chicken manure fertilizer at harvest age 1 is treatment K3 = 3 kg/plot amounting to 448.81 g, and the lowest is treatment K0 = 0 kg/plot amounting to 373.33 g. At harvest 2, the highest fruit weight of the plants is K3 = 3 kg/plot amounting to 798.33 g, and the lowest is treatment K0 = 0 kg/plot amounting to 684.56 g. At harvest 3, the highest fruit weight of the plants is K3 = 3 kg/plot amounting to 815.33 g, and the lowest is K0 = 0 kg/plot amounting to 707.89 g. At harvest 4, the highest fruit weight of the plants is K3 = 3 kg/plot amounting to 782.11 g, and the lowest is K0 = 0 kg/plot amounting to 668.92 g.

Table 6 also explains that the highest weight of the cultivated fruit due to the application of LOF pineapple peel waste at harvest age 1 is treatment S3 = 750 ml/liter of water/plot amounting to 428.03 g and the lowest in treatment S0 = 0 ml/liter of water/plot amounting to 377.17 g. At harvest 2, the highest weight of the cultivated fruit is S3 = 750 ml/liter of water/plot amounting to 724.31 g and the lowest in treatment S0 = 0 ml/liter of water/plot amounting to 675.11 g. At harvest 3, the highest weight of the cultivated fruit is S3 = 750 ml/liter of water/plot amounting to 756.33 g and the lowest is S0 = 0 ml/liter of water/plot amounting to 699.77 g. At harvest 4, the highest weight of the cultivated fruit is S3 = 750 ml/liter of water/plot amounting to 735.86 g and the lowest is S0 = 0 ml/liter of water/plot amounting to 691.99 g.

Table 6. Weight of Eggplant Crop (g) at Harvests 1, 2, 3, and 4

Treatment	Weight of Eggplant Crop (g)			
	Harvest 1	**Harvest 2**	**Harvest 3**	**Harvest 4**
Chicken Manure				
K0 = 0 kg/plot	373,33 aA	684,56 aA	707,89 aA	668,92 bA
K1 = 1 kg/plot	387,69 aA	688,54 aA	710,14 aA	709,13 abA
K2 = 2 kg/plot	399,03 aA	666,58 aA	726,69 aA	723,30 abA
K3 = 3 kg/plot	448,81 aA	798,33 aA	815,33 aA	782,11 aA
LOF Pineapple Peel Waste				
S0 = 0 ml/1 of water/plot	377,17 aA	675,11 aA	699,77 aA	691,99 aA
S1 = 250 ml/ 1 of water/plot	401,11 aA	726,01 aA	749,00 aA	724,03 aA
S2 = 500 ml/ 1 of water/plot	402,55 aA	712,58 aA	754,94 aA	731,58 aA
S3 = 750 ml/ 1 of water/plot	428,03aA	724,31 aA	756,33 aA	735,86 aA

Note: A significant difference at the 5% level (lowercase letters) and a highly significant difference at the 1% level (uppercase letters) are indicated by numbers in the same column followed by different letters.

Weight of Fruit Per Plot (g)

The results of the variance analysis on the weight of fruit per plot of eggplant plants indicate that the treatment of chicken manure has a significant effect, while the LOF of pineapple peel waste does not have a significant effect. The average weight of fruit per plot of eggplant plants can be seen in Table 7. Table 7 explains that the highest fruit weight per plot due to the application of chicken manure fertilizer at harvest age 1 is treatment K3 = 3 kg/plot amounting to 710.42 g, and the lowest is in treatment K0 = 0 kg/plot amounting to 594.42 g. At harvest 2, the highest fruit weight per plot is K3 = 3 kg/plot amounting to 868.77 g, and the lowest in treatment K0 = 0 kg/plot amounting to 754.28 g. At harvest 3, the highest fruit weight per plot is K3 = 3 kg/plot amounting to 823.11 g, and the lowest is K0 = 0 kg/plot amounting to 713.11 g. At harvest 4, the highest fruit weight per plot is K3 = 3 kg/plot amounting to 781.27 g, and the lowest is K0 = 0 kg/plot amounting to 698.75 g.

Table 7. Weight of Fruit per Plot (g) of Purple Eggplant Harvest 1, 2, 3, and 4

Treatment	Weight of Eggplant Per Plot (g)			
	Harvest 1	Harvest 2	Harvest 3	Harvest 4
Chicken Manure				
K0 = 0 kg/plot	594,42 aA	754,28 aA	713,11 aA	698,75 aA
K1 = 1 kg/plot	604,58 aA	813,25 aA	717,80 aA	732,56 aA
K2 = 2 kg/plot	620,00 aA	837,33 aA	761,47 aA	763,38 aA
K3 = 3 kg/plot	710,42 aA	868,77 aA	823,11 aA	781,27 aA
LOF Pineapple Peel Waste				
S0 = 0 ml/ 1 of water/plot	613,00 aA	774,77 aA	712,38 aA	716,14 aA
S1 = 250 ml/ 1 of water/plot	631,58 aA	797,55 aA	759,27 aA	739,75 aA
S2 = 500 ml/ 1 of water/plot	640,75 aA	818,55 aA	761,92 aA	759,83 aA
S3 = 750 ml/ 1 of water/plot	644,08 aA	882,75 aA	781,92 aA	760,25 aA

Note: A significant difference at the 5% level (lowercase letters) and a highly significant difference at the 1% level (uppercase letters) are indicated by numbers in the same column followed by different letters.

Table 7 also explains that the weight of fruit per plot is highest due to the application of LOF pineapple peel waste at harvest age 1, which is treatment S3 = 750 ml/liter of water/plot amounting to 644.08 g, and the lowest in treatment S0 = 0 ml/liter of water/plot amounting to 613.00 g. At harvest 2, the weight of fruit per plot is highest at S3 = 750 ml/liter of water/plot amounting to 882.75 g, and the lowest in treatment S0 = 0 ml/liter of water/plot amounting to 774.77 g. At harvest 3, the weight of fruit per plot is highest at S3 = 750 ml/liter of water/plot amounting to 781.92 g, and the lowest at S0 = 0 ml/liter of water/plot amounting to 712.38 g. At harvest 4, the weight of fruit per plot is highest at S3 = 750 ml/liter of water/plot amounting to 760.25 g, and the lowest at S0 = 0 ml/liter of water/plot amounting to 716.14 g.

This study explains that the treatment of chicken manure fertilizer has a significant effect on the parameters of plant height (cm), fruit length (cm), and fruit weight per planting (g), and does not have a significant effect on the parameters of stem diameter (mm), number of fruits per planting, number of fruits per plot (fruits), and fruit weight per plot (g).

This may be due to the fact that chicken manure fertilizer is contributes significantly to enhancing the physical, chemical, and biological qualities of the soil and the ecosystem, and is one of the primary sources of soil nitrogen. In the soil, organic fertilizers are decomposed by organisms into humus or organic matter. Chicken manure fertilizer can enhance soil fertility, improve soil structure through the capacity for cation exchange, aeration, water retention, and soil aggregate stabilization. A good soil structure allows for better root development, thereby increasing the absorption area for nutrients, which can lead to improved crop productivity. The application of organic fertilizers to the soil is very beneficial for improving the physical properties of the soil, such as structure, porosity, soil aeration, and others. With the presence of better physical properties of the soil, there are two benefits for plants. First, the plant roots can grow and develop well, allowing their

function as organs for absorbing nutrients and water from the soil to proceed effectively. Second, loose soil will provide freedom for the roots to develop optimally (Marlina et al., 2021).

The application of chicken manure fertilizer on the stem diameter of eggplant is not influenced by the application of chicken manure compost, but is affected by temperature and altitude. In order for the plants to grow well, the ideal temperature for their growth must be met. Eggplants are generally known to be able to grow within a fairly wide temperature range, specifically between 22 - 30 ˚C during the day and 9 – 12 ˚C at night. The growth of stem diameter is influenced not only by the environment but also by the genetic factors of the plants themselves, thus the application of chicken manure compost does not affect the growth of the stem diameter of the plants (Jaisyurahman et al., 2020).

The length of the fruit on the purple eggplant plant is influenced by the application of chicken manure fertilizer. It is suspected that the nutrients in the chicken manure fertilizer are sufficiently available to the plants during the fruit development process. This adequate nutrient content is capable of supplying nutrition, resulting in optimal eggplant fruit length. This is due to the potassium nutrient contained in cow manure fertilizer, which has a positive effect on fruit development (Khadijah et al., 2021). According to Listyaningsih et al., (2014) it states that the application of manure has a significant effect on the weight, diameter, and length of the fruit.

According to Tufaila et al., (2014), In addition to containing 1.5 % nitrogen and 1.3 % phosphorus, which are quite high, chicken manure also contains 0.8 % potassium, which acts as an enzyme activator in carbohydrate and nitrogen metabolism, including the formation, breakdown, and translocation of starch, as well as influencing phosphorus transport. The application of chicken manure fertilizer can provide the nutrients needed by plants during the fruit formation process, and the high nitrogen content in chicken manure fertilizer can enhance growth and production. One of the elements that supports fruit development is phosphorus. The availability of this phosphorus is crucial for achieving good results. According to Hertos (2015) It states that the content of this element P can enhance crop yields and accelerate the ripening process.

Minarsih et al., (2013) It states that the process of photosynthesis requires nitrogen significantly, where this essential nutrient plays a role in the formation of chlorophyll and is another material in the formation of new cells. This real influence is also caused by the fulfillment of the need for N elements for plant growth in the generative phase. Nitrogen can accelerate growth and provide greater yields, promoting vegetative growth such as leaves, stems, and roots, which play an important role in plants during the generative phase. The sufficiency of nitrogen results in an increase in the weight of the fruit in the treatment of chicken manure fertilizer.

The lack of influence of pineapple peel LOF on all parameters may be caused by the incomplete decomposition process, so that when applied to plants, the decomposition process will continue, resulting in low nitrogen nutrients due to their use for the nutrition of decomposer microorganisms. At the beginning of growth, plants require nitrogen for the growth of stem and leaf organs. If nitrogen is insufficient

at the beginning of growth, the height of the plants will be hindered (Sianturi et al., 2021).

The pineapple peel waste LOF shows slower growth compared to chicken manure fertilizer. According to Satria et al., (2015) The nutrient elements stimulate the root development of plants, allowing the roots to better absorb the nutrients utilized by the plants in the formation of new tissues, including the increase in stem diameter. In addition, according to Puspadewi et al., (2016) fertilizers containing NPK are essential for plant growth, particularly in stimulating the increase in stem diameter.

The pineapple peel waste does not affect all parameters, which may occur due to environmental factors on the plants, such as locust pest attacks. Leaves affected by locust pests cannot perform photosynthesis optimally because the leaves have holes. This is in accordance with the opinion expressed by Andianto & Armaini (2015), The abnormal leaves cannot perform photosynthesis optimally to produce various compounds needed by plants during their growth and fruit development. Another factor is the high and continuous rainfall, which causes the application of liquid organic fertilizer from pineapple peels to be less effectively absorbed by the plants, as most of it is carried away by water flow. The application of liquid organic fertilizer can be adjusted according to weather conditions to prevent the loss of nutrients due to leaching and volatilization before they can be absorbed by the roots and undergo fixation in the soil, resulting in their unavailability for plant absorption (Pratama et al., 2018).

CONSCLUSION

Chicken manure fertilizer affects the parameters of plant height (cm), fruit length (cm) and fruit weight per plant (fruit). K3 = 3 kg/plot treatment is the best concentration in increasing the growth and production of purple eggplant. Liquid organic fertilizer of pineapple peel waste has no effect on all parameters, but the growth and production of eggplant plants increase. Fruit length (cm) in the K3 chicken manure fertiliser treatment of 20.09 cm and the treatment of pineaple peel waste S3 of 18.83 cm, fruit weight per plant (g) in the K3 chicken manure fertiliser treatment of 782.11 g, and the application of organic fertiliser of pineapple skin waste S3 of 735,86 g and had no discernible impact on the following parameters: fruit weight per plot (g) in the treatment of chicken manure fertiliser K3 of 781.27 g and organic fertiliser treatment of pineapple skin waste S3 of 7.14 g; number of fruits per plant (fruit) in the K3 chicken manure fertiliser treatment of 7.46 fruit and the organic fertiliser treatment of pineapple skin waste S3 of 7, 18 fruit; number of fruits per plot (fruit) in the treatment of chicken manure fertiliser K3 of 7.33 fruit and the organic fertiliser treatment of pineapple a skin waste S3 of 760.25 g.

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