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Combination Effects of Cocopeat and Chicken Manure on the Vegetative Growth and Yield Performance of Eggplant

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ABSTRACT

Eggplant (*Solanum melongena* L.) growth and productivity are influenced by growing-medium composition and nutrient availability. This study evaluated the effects of cocopeat and chicken manure combinations on purple eggplant growth and yield. The experiment was conducted from May to July 2022 at Madako University, Tolitoli, Indonesia, using a randomised block design with five treatments and three replications: C0 (control), C1 (25 g cocopeat + 150 g chicken manure), C2 (50 g + 200 g), C3 (75 g + 250 g), and C4 (100 g + 300 g), comprising 45 experimental units. Parameters included plant height, leaf number, flowering time, productive branches, fruit number, fruit length, diameter, and weight. At six weeks after planting, C4 recorded the highest numerical plant height (48.40 cm), compared with 33.39 cm in the control. C4 also produced the earliest flowering (38 days after planting) and five productive branches, compared with 47 days and two branches in the control, respectively. Fruit length in amended treatments ranged from 19.7 to 21.0 cm, while fruit weight generally exceeded that of the control. Treatment responses varied across parameters and harvesting periods. Although C4 showed favorable results for several characteristics, it was not consistently superior. Further research is needed to confirm statistical differences and evaluate economic feasibility before practical recommendations can be established.

Keywords: Coconut fiber, coconut waste, horticulture, kohe

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INTRODUCTION

Eggplant (*Solanum melongena* L.) is an important horticultural crop grown for its agricultural and economic value. Its growth and productivity are influenced by genetic characters, environmental conditions, properties of the growing medium and nutrient management. Availability of

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adequate nutrients and root zone conditions are essential to support vegetative growth, flowering, fruit formation and fruit development (Putra et al., 2025). Hence, suitable growing-medium amendments and proper nutrient management strategies are essential for boosting eggplant growth and productivity, while also protecting soil quality and fostering sustainable crop production (Mansurat et al., 2023).

Interest in using organic amendments to improve crop production and promote more sustainable nutrient management is increasing. Cocopeat is a fine material derived from coconut husk. It can be used as a component of the growing medium because of its water-holding capacity and its influence on the substrate's physical properties. Meanwhile, chicken manure provides organic matter and plant nutrients that support crop growth. Meanwhile, chicken manure provides organic matter and plant nutrients that can promote crop growth. Cocopeat and organic manure have been investigated for horticultural production. For example, Sanyang et al. (2025) how different organic fertilisers affect the growth and yield potential of eggplant and other vegetable crops. The use of cocopeat and manure for chili pepper planting was studied by Nasution & Tammin T. (2022). These studies give relevant information for the study of organic amendments, but results from other crops and growing conditions cannot be directly extrapolated to purple eggplant.

Recent research further demonstrated the importance of evaluating organic fertilisation strategies, particularly for eggplant. Ramadhan et al. (2024) studied the compost and digestate in combination with plant-based and microbial biostimulants. The results indicated that the fertilisation strategies affected the productivity of eggplant and the biostimulant treatments affected some selected characteristics of fruit quality. The study underscores the need to evaluate organic nutrient management practices in terms of specific agronomic outcomes. However, its emphasis on compost, digestate and biostimulants is different from the cocopeat and chicken manure combination evaluated in the present study.

Although the use of organic amendments in eggplant production is increasingly being considered, the response to a specific combination of cocopeat and chicken manure needs further assessment under specific growing conditions. Particularly, the performance of different combinations of applications should be compared based on vegetative growth and fruit-related parameters rather than a single growth parameter. However, the interpretation of these responses should also be based on the experimental conditions and the possibility of different plant characteristics responding differently to the same combination of amendments (Mostfa et al., 2025).

Therefore, the present study was conducted to evaluate five combinations of cocopeat and chicken manure, including an unamended control, on vegetative growth and yield-related characteristics of purple eggplant. The treatments were C0 (control), C1 (25 g cocopeat + 150 g chicken manure), C2 (50 g cocopeat + 200 g chicken manure), C3 (75 g cocopeat + 250 g chicken manure), and C4 (100 g cocopeat + 300 g chicken manure). We

measured plant height, number of leaves, flowering age, number of productive branches, number of fruits, fruit length, diameter, and fruit weight.

The contribution of this study is the evaluation of specific cocopeat - chicken manure combination treatments on multiple vegetative and reproductive parameters under the experimental conditions in Tolitoli, Indonesia. The study provides site-specific experimental evidence on the possible use of these organic materials in purple eggplant cultivation by comparing the responses among the five treatments. The combined treatments were analysed rather than the independent effects of each material because cocopeat and chicken manure rates were increased simultaneously. The results are intended to inform further research on organic growing-medium formulations and provide a basis for more comprehensive experiments involving separate amendment treatments, additional controls and evaluation across different growing environments.

Literature Review

Eggplant (*Solanum melongena* L.) is a widely cultivated vegetable crop of high nutritional value and economic importance. It has vital nutrients like dietary fiber, vitamins and minerals, which are beneficial for human health. Although eggplant has great potential for economic development and food security, its production is constrained by low soil fertility, traditional farming practices and overdependence on synthetic fertilisers. Park et al. (2024) extensive studies have found that prolonged use of chemical fertilisers affects the soil structure, drastically reduces microbial diversity, contaminates the groundwater and poses serious challenges to long-term environmental sustainability and crop production.

Cocopeat has been reported to improve root development, water-holding capacity and provide a good environment for plant growth, especially in dryland areas (Wu et al., 2025). Besides, cocopeat is an economical and eco-friendly option that can be a sustainable alternative to the traditional media for growing.

Knowledge of the interaction of these two materials is a prerequisite for the development of efficient and sustainable fertilisation strategies. The present study is therefore aimed at filling this gap by evaluating the combined effects of cocopeat and chicken manure on eggplant growth and yield to advance environmentally friendly agricultural methods. Previously, it has been shown that the use of chicken manure improves vegetative growth, flowering and yield of different crops, as in eggplant (Soares & Gomes, 2024). Too much can cause toxicity or nutrient imbalance. So the dose and the mixing with other ingredients are important.

The synergistic effect of combining organic compounds in plant growth promotion has been studied in recent years. It has been proven that cocopeat + chicken manure improves soil structure, nutrient availability and water retention capacity. This combination gives a healthy root-zone environment for efficient nutrient uptake and vegetative and reproductive

growth. Moreover, the interaction of organic matter and soil microorganisms has a significant effect on enhancing nutrient mineralisation and plant performance (Setiawan & Sudradjat, 2025).

Though the individual effects of cocopeat and organic fertilisers have been studied by a few researchers, little work has been done on the combined application of these materials, particularly when growing eggplants. It is necessary to understand the interaction between these two materials to be able to develop efficient and sustainable fertilisation strategies. Hence, the objective of this study was to fill this gap by assessing the combined effects of cocopeat and chicken manure on the growth and yield of eggplant, contributing to the progress of environmentally friendly agricultural methods.

MATERIALS AND METHODS

The experiment was conducted from May to July 2022 at the Experimental Land of the Faculty of Agriculture, Madako University, Tolitoli, Indonesia. This study was conducted to evaluate the effects of combinations of cocopeat and chicken manure on the vegetative growth and yield performance of purple eggplant (*Solanum melongena* L.).

The experiment was laid out in a Randomised Block design (RBD) with five treatments and three blocks, giving a total of 15 treatment-by-block experimental units. The treatments were C0 (control), C1 (25 g cocopeat + 150 g chicken manure), C2 (50 g cocopeat + 200 g chicken manure), C3 (75 g cocopeat + 250 g chicken manure), and C4 (100 g cocopeat + 300 g chicken manure). Each experimental unit was made up of three polybags, making a total of 45 polybags.

For statistical purposes, the experimental unit was defined as the smallest unit to which an independent assignment of a treatment could be made. If the three polybags within each treatment by block unit received the same treatment and had not been independently randomised, the three polybags were treated as subsamples, not independent experimental replicates. In this case, the observations in the three polybags must be averaged within each experimental unit before comparing treatments. This gives three independent replicates per treatment. This method avoids pseudoreplication and ensures that the statistical analysis reflects the true experimental design. Therefore, the number of independent replicates was three per treatment, as the three blocks were independently set up and treatments were randomised within each block. Experimental workflow can be seen at Figure 1.

Research Procedures

The research procedure started with the preparation of coconut fiber powder (cocopeat). The dried coconut fiber was cut into smaller pieces and brushed with a one- or two-directional wire brush to separate the fibers into a mixture of coarse fiber and fine powder. The mixture was then filtered to separate the fine powder from the coconut fiber. The cocopeat obtained was washed with clean water until the foam disappeared and then soaked in clean water

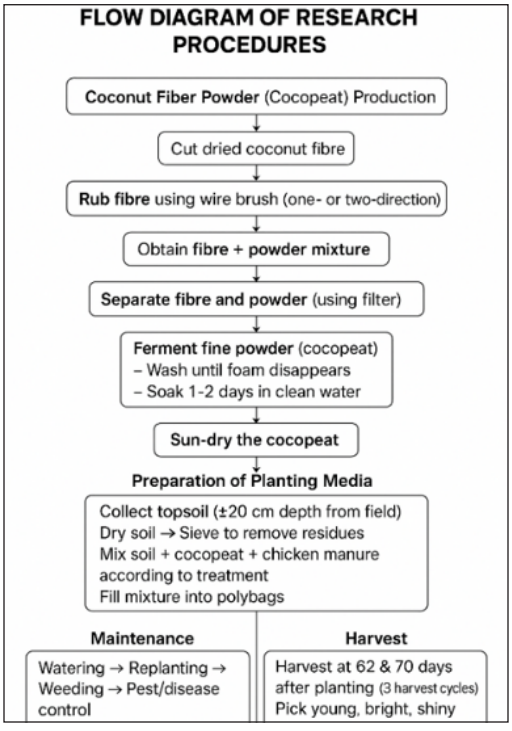

Figure 1. Experimental workflow for cocopeat preparation, growing-medium formulation, eggplant cultivation, and data collection under a randomised block design (RBD). The experiment consisted of five treatments and three blocks, with three polybags per treatment-by-block unit, for a total of 45 polybags

for 1-2 days. The cocopeat was soaked and then dried under the sun for use as part of the planting medium.

Topsoil was collected from approximately 20 cm depth, air-dried, and sieved to remove coarse materials. The prepared soil was used as the base growing medium in the polybags. The amount of topsoil in each polybag was 1.3 kg. The specified amount of soil was thoroughly mixed with the corresponding amount of cocopeat and chicken manure according to the assigned treatment. The control treatment (C0) was the base soil only without the supplement of cocopeat or chicken manure.

The growing media were prepared before the eggplant seedlings were transplanted. The mixture was packed in polybags, and the seedlings were transplanted and maintained under the same cultivation conditions. As required, watering, weeding and pest and disease control were carried out during the experimental period.

During the maintenance period, the plants were watered regularly as per their requirements. Where plants did not establish well, replanting was done as necessary. Weed control and pest and disease management were also carried out to maintain suitable growing conditions throughout the experiment.

Harvest was taken at 62 and 70 days after sowing as per the experimental procedure. The fruits selected were ripe and had physical characteristics such as a bright appearance and shiny skin. Thereafter, the harvested fruits were subjected to assessment of relevant yield parameters in accordance with the study protocol.

Observation Variables

Plant height and number of leaves were measured on the same plants at 2, 3, 4, 5, and 6 WAP. Plant height was measured in cm from the soil surface to the growing point, and the number of leaves was determined by counting the fully expanded leaves. Flowering age was recorded as the number of days after planting until the first flower was observed.

Yield-related parameters included the number of productive branches, number of fruits, fruit length, fruit diameter, and fruit weight. Fruit length was measured with a ruler and diameter with digital calipers, and fruit weight was measured with an analytical balance. Fruit observations were made at the relevant time for each parameter at 67, 72 and 76 days after planting (DAP). Repeated observations from the same plant were considered as correlated measurements instead of independent observations.

Statistical Analysis

Statistical analysis was conducted in a randomised complete block design. For responses measured once per experimental unit.

Plant height and leaf number, repeatedly measured at 2-6 WAP, were analysed using a repeated-measures linear mixed-effects model with treatment, observation time, and their interaction as fixed effects, and block and experimental unit as appropriate random effects. The model also accounted for the covariance between repeated measurements on the same experimental unit. When the same experimental units were observed across multiple harvest dates, yield parameters collected at those dates were analysed using a corresponding repeated-measures model. If measurements represented different independent experimental units at each harvest, date-specific analyses were performed instead.

Residual distributions were inspected for approximate normality before conducting inferential analysis, and residuals versus fitted plots were examined for homogeneity of variance. Further diagnostic tests were used where appropriate to assess model assumptions. Data transformations or alternative models were considered when the assumptions were not met adequately.

Where there was a significant treatment effect, treatment means were separated by Duncan's Multiple Range Test (DMRT) at $P \leq 0.05$, if the model and comparison procedure were appropriate for the response variable being analysed. Results are reported as treatment means, measures of variability, effect sizes, and 95% confidence intervals where appropriate. Exact p-values were given for the statistical tests of interest. Separate repeated-measures analyses were conducted for the treatment effect, the observation-time effect, and the treatment-by-time interaction. Statistical Duncan's multiple range test (DMRT) at $P \leq 0.05$ was calculated.

All analyses were performed using the statistical software and version as described in the original analysis. Degrees of freedom and IBM SPSS Statistics version 29 software were recorded for reproducibility.

RESULTS AND DISCUSSION

The chemical properties of the soil used as a growing medium were revisited to ensure that the reported values, units of analysis and interpretations were consistent with the original

laboratory data. Special attention was given to soil pH measured in water and potassium chloride (H2O and KCl pH) and to the reported concentrations of calcium, phosphorus and potassium. These are shown in Table 1.

Reported pH values were 6.96 (pH H2O) and 4.77 (pH KCl). These measurements correspond to different analytical conditions and therefore should be reported separately, specifying the extraction methods. The calcium, P2O5 and K2O values must also be checked against the original laboratory report for units, analytical basis and accuracy. Any interpretation of soil fertility will be changed only when these values have been confirmed. More is shown in Table 2.

Table 1
Soil chemical properties and texture before experiment

Parameter	Value	Unit	Measurement Method
C-Organic	2.92%	%	Walkley and Black
N-Total	0.24%	%	Kjeldahl
Calcium (Ca)	13.63*	%*	Titrimetri
Potassium (K)	0.23*	%*	Flamephotometer
Sodium (Na)	0.02*	%*	Flamephotometer
P_2O_5	25.42*	%*	Spektrophotometer UV-Vis
K_2O	31.31*	%*	Spektrophotometer UV-Vis
pH (H_2O)	6.96	-	Potensiometer
pH (KCl)	4.77	-	Potensiometer
Soil Texture	Dusty Clay	-	-

*Source: Soil Science Unit Laboratory, Faculty of Agriculture, Tadulako University (2021)

Table 2
Chemical properties of chicken manure + cocopeat

Parameter	Value	Unit	Measurement Method
Nitrogen (N)	2.10%	%	Kjeldahl
Phosphorus (P)	0.219%	%	Spektrophotometer UV-Vis
Potassium (K)	0.803%	%	Spektrophotometer UV-Vis
C-Organic	42.29%	%	Walkley and Black
C/N Ratio	20.13		-

*Source: Soil Science Unit Laboratory, Faculty of Agriculture, Tadulako University

Plant Height

Based on the results of the ANOVA and 5% DMRT test, the average height of purple eggplant plants shows that the combination treatment of cocopeat with chicken manure has a significant effect at ages 4 and 6 (WAP) and no significant effect at ages 2, 3, and 5 (WAP) (Figure 2).

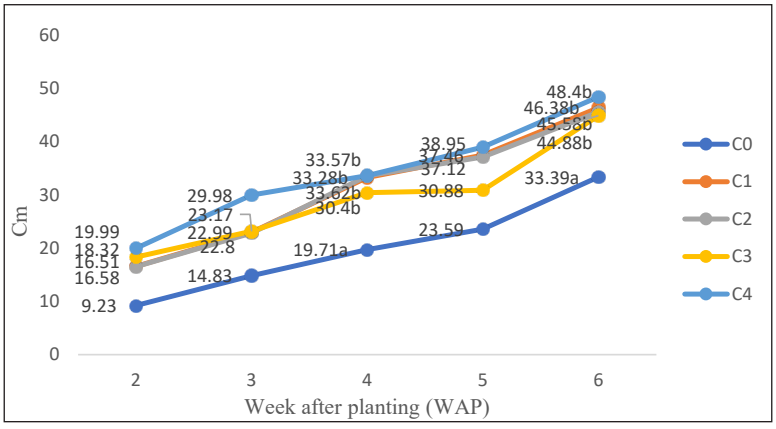

Figure 2. Illustrates the effect of cocopeat and chicken manure on Plant Height. Numbers marked with different letters in the same graphic show (DMRT) at $P \leq 0.05$

In all five treatments, plant height increased over the observation period from 2 to 6 weeks after planting (WAP). But the size of the increase differed between treatments. The plant height was 9.23 cm in the control treatment (C0) and 19.99 cm in C4 at 2 WAP. At 3 WAP, C4 was the tallest treatment at 29.98 cm, while C0 was 14.83 cm.

C4 had a plant height of 33.57 cm at 4 WAP, followed by C2 with a height of 33.28 cm. The lowest height was recorded in the C0 treatment (19.71cm). Maximum plant height at 5 WAP was observed in C4 (38.95cm), followed by C2 (37.12cm), C1 (36.45cm), C3 (30.88cm) and C0 (23.59cm).

At 6 WAP, C4 was still the tallest treatment (48.4 cm), followed by C1 (46.38 cm), C2 (45.5 cm) and C3 (44.88 cm). The plant height was lowest in the control treatment (33.39 cm). In general, the graph indicates that the treatments with cocopeat and chicken manure were associated with higher plant height than the control, with C4 showing the highest final value.

The increase in eggplant plant height from 2 to 6 WAP indicated that the plants were still growing across all treatments during the observation period. However, the differences in plant height among treatments suggest that the growing medium formulations may have influenced vegetative development. The application of cocopeat and chicken manure was associated with higher plant height compared to the control, but the magnitude of the response varied across observation times (Fernanda et al., 2025).

The highest plant height was recorded in treatment C4, containing 100g cocopeat and 300g chicken manure. The plant height reached 48.4 cm at 6 WAP. The control treatment (C0) reached 33.39 cm, in comparison. The difference was 15.01 cm, indicating about 45.0% higher plant height in C4 than in C0. This comparison is a description of the numerical difference between the treatments and is not to be taken as statistically significant unless backed up by the appropriate statistical test.

The relatively taller plants under C4 may be due to the combined effects of cocopeat and chicken manure on the growing medium. Cocopeat improves water retention and modifies the growing medium's physical properties, while chicken manure provides organic matter and nutrients for plants. Adequate water and nutrient availability can favor cell division, cell elongation, leaf development, and stem growth. However, these mechanisms are still plausible explanations since the experiment did not directly measure changes in substrate water retention, nutrient availability, or nutrient uptake (Poliquit, 2025).

The response was not perfectly consistent across observation periods. The heights recorded at 4 WAP for C4 (33.57 cm) and C2 (33.28 cm) were relatively similar. At 5 WAP, C4 was 38.95 cm, compared with 30.88 cm for C3. By 6 WAP, the height of C1, C2, C3, and C4 ranged from 44.88- 48.4 cm, showing that differences among the amended treatments were relatively small compared with the difference between these treatments and the control. This pattern indicates that the highest amendment rate did not necessarily yield a proportionally greater response at each observation time.

The relatively low plant height in C0 could be due to the absence of additional cocopeat and chicken manure in the growing medium. This interpretation must be approached with caution, however, as the initial soil conditions, the availability of nutrients during the growth of the plants and other environmental factors could also have influenced the development of the plants.

Number of Leaves

The results of ANOVA and 5% DMRT test are shown in Figure 3. The average number of leaves of purple eggplant plants showed that the combination treatment of cocopeat and chicken manure significantly impacted the number of leaves.

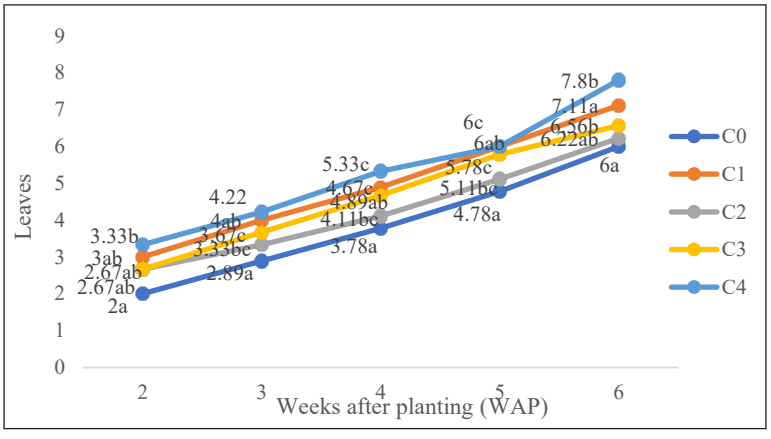

Figure 3. Influence of cocopeat and chicken manure on the number of Leaves. Numbers followed by different letters in the same graphic are (DMRT) at $P \leq 0.05$

The number of leaves increased gradually from 2 to 6 weeks after planting (WAP) in all the treatments, though the magnitude of the increase varied among the cocopeat and manure combinations. At 2 WAP, leaves were maximum in treatment C4 (100 g cocopeat + 300 g manure) i.e. 3.33 followed by C1 (25 g cocopeat + 150 g manure) i.e. 3.00, C2 (50 g cocopeat + 200 g manure) i.e. 2.67, C3 (75 g cocopeat + 250 g manure) i.e. 2.67 and C0 (control) i.e. 2.00. At 3 WAP, C4 was still highest with 4.22, followed by C1 with 4.00, C3 with 3.67, C2 with 3.33 and C0 with 2.89. The number of leaves at 4 WAP for C4 was 5.33, while it was 4.89, 4.67, 4.11 and 3.78 for C1, C3, C2 and C0, respectively (Figure 3). Similarly, at 5 WAP, the same general trend continued, with C4 and C1 having about 6.00 and 5.78 leaves, respectively, followed by C3 at 5.38, C2 at 5.11 and C0 at 4.78. At 6 WAP, C4 had the highest value (7.80 leaves), followed by C1 (7.11), C3 (6.56), C2 (6.22) and C0 (6.00). C4 produced the highest number of leaves in general during the observation period, while the control treatment generally recorded the lowest values.

The increased number of leaves in treatment C4 could be due to the synergistic effects of cocopeat and manure on the growing-medium conditions and nutrient supply. Cocopeat helps in retaining water and moisture around the root zone, whereas manure helps in providing organic matter and vital nutrients for vegetative growth. Adequate water and nutrient availability are important for leaf initiation and expansion and the development of new shoots (Liu et al., 2021). The progressive increase in leaf number from 2 to 6 WAP in all the treatments indicates that the plants were still developing vegetative tissues during the period of observation. However, the higher response under C4 suggests that the mixture of 100 g cocopeat and 300 g manure could have provided better growing conditions than the other treatments. These explanations are potential mechanisms and would require supporting measurements of nutrient availability, growing-medium properties, or other growth parameters to be confirmed (Kamaluddin et al., 2022).

The treatment C4 at 6 WAP produced 7.80 leaves and the control treatment produced 6.00 leaves, which is an increase of about 30%. The difference showed that the highest combination of cocopeat and manure was associated with greater leaf production under the experimental conditions. More leaves may cause more light interception and photosynthetic capacity, which may support more plant growth and development (Lukman & Kusrianty, 2021). However, based on the differences observed in the graph, these should not be considered statistically significant until analysis of variance (ANOVA) and a suitable post hoc test are performed. The results showed that the combination of 100 g cocopeat and 300 g manure was the most promising treatment to increase the number of leaves during the six-week observation period. Further statistical analysis and evaluation of other parameters of growth and yield are needed to determine if this treatment is a consistent agronomic benefit. Reduced water stress also supports early leaf formation in cocopeat-based media (Shintiavira et al., 2023).

Flowering Age

The combined effect of cocopeat with chicken manure significantly affects the mean Flowering Age of purple eggplant plants. More in Figure 4.

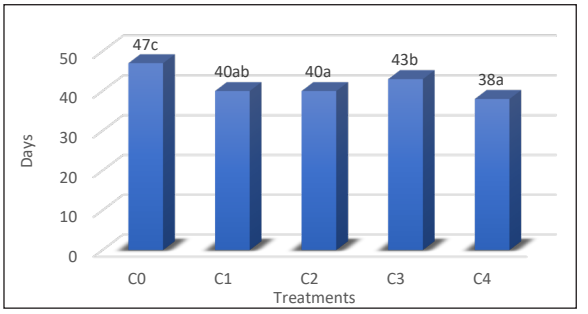

Figure 4. Illustrates the effect of cocopeat and chicken manure on Flowering Age. Numbers marked with different letters in the same graphic show (DMRT) at $P \leq 0.05$

The results of the study show that the application of different treatments (C1- C4) had a remarkable influence on the flowering age of plants compared with the control (C0). The control treatment had the latest flowering age (47 days), suggesting a slower physiological transition from vegetative to reproductive growth. By comparison, all treatments resulted in earlier flowering, with flowering ages ranging from 38 to 43 days. C1 and C2 treatments resulted in similar flowering ages (40 days). Statistical grouping of C1 and C2 treatments (ab and a) indicates that both treatments were effective in promoting earlier floral initiation compared to the control. Treatment C3 had a moderate effect (43 days) and was classified in group b, while treatment C4 had the earliest flowering (38 days) and was classified as a, indicating the most potent effect among all treatments.

Fitrianti et al. (2023) emphasise the importance of nutrient management and organic amendments in regulating flowering physiology. Recent research has highlighted that improved nutrient availability, especially nitrogen and phosphorus, boosts metabolic and hormonal processes driving reproductive development (Adnan et al., 2023). Improved nutrient status has been reported to result in increased growth regulators (auxins, gibberellins and cytokinins) and is closely associated with floral induction pathways. Early flowering in treatments C1-C4 suggests that these treatments probably improved nutrient uptake efficiency or supplied bioactive compounds which stimulated the shift to reproductive growth, in agreement with the hormonal and metabolic mechanisms.

Moreover, studies during this period Panjaitan et al. (2023) indicate that suitable fertilisation strategies or organic amendments can shorten flowering time by 10- 20% in several crop species. The results obtained for treatment C4, which was the earliest flowering treatment, support these findings and suggest that the composition of this treatment may have provided a more balanced nutrient profile or better bioavailability. Overall, the outcomes validate that the implementation of enhanced nutrient-based treatments can substantially control and optimise flowering time, strengthening the wider scientific consensus set in recent literature.

Number of Production Branches

Based on the ANOVA and 5% DMRT results, Figure 5 presents the average number of production branches in purple eggplant plants. The combination of cocopeat and chicken manure significantly affected the number of production branches.

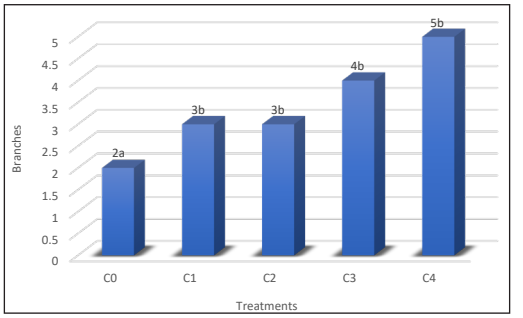

Figure 5. The average number of production branches of purple eggplant plants shows that the combination treatment of cocopeat with chicken manure has (DMRT) at $P \leq 0.05$

Results indicate that the number of production branches differed significantly among treatments (C0-C4). The control (C0) showed the least number of branches, with 2 branches, indicating less vegetative development in the untreated condition. In contrast, the number of production branches was considerably increased by all treatments applied (C1-C4). Treatments C1 and C2 had three branches each and were statistically classified as b, showing a significant increase over the control. Treatment C3 showed four branches and was still in the same statistical group, suggesting a more intense but similar stimulatory effect. The response was most prominent in treatment C4, which resulted in five branches and was in group b, indicating that this treatment produced the highest degree of vegetative branching of all treatments.

Kartika et al. (2025) emphasised that nutrient management, organic amendments and growth-promoting substances are important in the development of branches in horticultural crops. During this period, it has been found that enhancement of nutrient supply, particularly nitrogen and phosphorus, increases axillary bud activation through modulation of auxin-cytokinin balance, an important regulatory mechanism of lateral shoot initiation. Cytokinins stimulate the development and growth of lateral buds, and sufficient nitrogen availability supports strong vegetative growth, which supports the formation of branches.

Moreover, Wasis & Fitriani (2022) stated that the use of organic fertilisers and bioactive soil amendments improves photosynthetic efficiency, carbon allocation, and soil biological activity, which later increases vegetative branching. The enhanced responses in treatments C3 and C4 suggest that these treatments might have had higher nutrient concentrations or more available forms of nutrients, which provided better physiological support for branch development.

In general, the increase in the number of production branches from C1 to C4 indicates the effectiveness of these treatments on vegetative growth. Specifically, the superior performance of treatment C4 aligns with recent literature suggesting that optimised nutrient formulations can improve branching by 20-40%, depending on plant species and treatment characteristics. These results are consistent with general scientific knowledge

that enhanced nutrient management is part of maintaining vegetative structure and yield formation in cultivated plants.

Number of Fruits

The results of ANOVA and DMRT at 5% are presented. The combined cocopeat and chicken manure treatment significantly affects the average number of fruits of purple eggplant plants. See more in Figure 6.

Based on Figure 6, the combination of cocopeat and manure showed different responses to the observed parameter at 67, 72, and 76 days after planting (DAP). At 67 DAP, treatment C4 (100 g cocopeat + 300 g manure) had the highest value of 1.78 units followed by C3 (75 g cocopeat + 250 g manure) 1.33 units, C2 (50 g cocopeat + 200 g manure) 1.22 units, C1 (25 g cocopeat + 150 g manure) 1.11 units and C0 (control) 1.00 unit. C4 had the highest value (2.56 units) at 72 DAP, followed by C3 (2.00 units), C1 (1.33 units) and C0 and C2 (1.22 units each). The maximum value was 4.11 units at 76 DAP for C4, followed by C3 (2.56 units), C2 (2.11 units), C1 (1.78 units), and C0 (1.11 units). These results indicate that C4 always produced the highest observed values during the period of observation, with the greatest increase between 72 and 76 DAP.

The increased values in treatment C4 could be due to the synergistic effects of cocopeat and manure on the growing medium. Cocopeat has water-retention properties, which can help keep moisture available around plant roots, and manure can add organic matter and vital nutrients that support plant growth and development. Also, the breakdown of manure can provide a slow release of nutrients, and the cocopeat can help to keep the physical conditions of the growing medium favorable. Thus, the combination of these materials may support water and nutrient availability during the observation period.

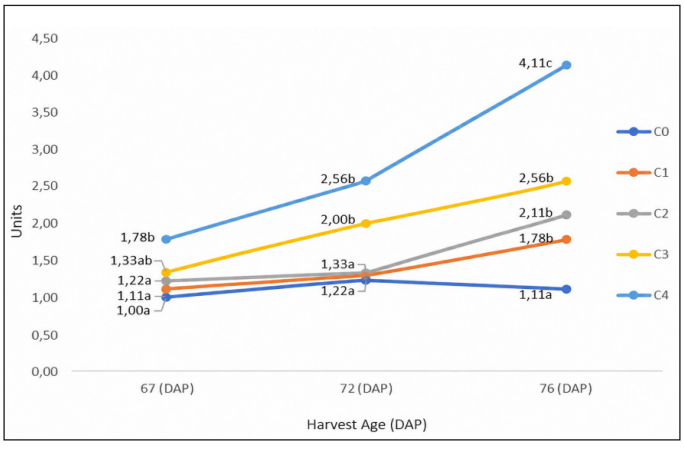

Figure 6. Effect of cocopeat and chicken manure on the number of Fruits. Numbers in the same chart with different letters are (DMRT) at $P \leq 0.05$

However, these explanations are possible mechanisms based on the observed trends and need to be supported by additional measurements of properties of the growing medium and other relevant parameters of plant growth (Yanti et al., 2025).

The observed values of C4 were more and more different from the control treatment with increasing harvest age. At 76 DAP, C4 was 4.11 units, which is about 3.70 times the control value (1.11 units). The result revealed that among the treatments tested, a mixture of 100g cocopeat and 300g manure gave the best result. However, without confirmation by analysis of variance (ANOVA) and an appropriate post hoc test, the differences observed cannot be statistically significant. Overall, the results showed that the blend of cocopeat and manure might result in better plant responses at the time of harvest, with C4 consistently yielding the highest values (Shafira et al., 2021). Further assessment of statistical significance, cost of application and growing conditions is required before this combination can be recommended as the optimum treatment. At 76 DAP, the highest production was still in C1 with 2.56 fruits, followed by C3 (2.11) and C2 (1.78). There was little effect of C4, indicating that adding too much manure does not enhance fruiting. Interestingly, the control sharply increased to 4.11 fruits, likely in a delayed reproductive response under nutrient stress, a pattern noted previously in crops experiencing nutrient-limited conditions (Ardi & Nuraeni, 2023).

Fruit Length

The results of the ANOVA and 5% DMRT test were presented in Figure 7. The average Fruit Length of purple eggplant plants shows that the treatment combination of cocopeat with chicken manure has a significant effect on Fruit Length of purple eggplant plants.

Results show that the combination of cocopeat and chicken manure consistently influenced fruit length of eggplant at the three harvest ages (67, 72 and 76 DAP).

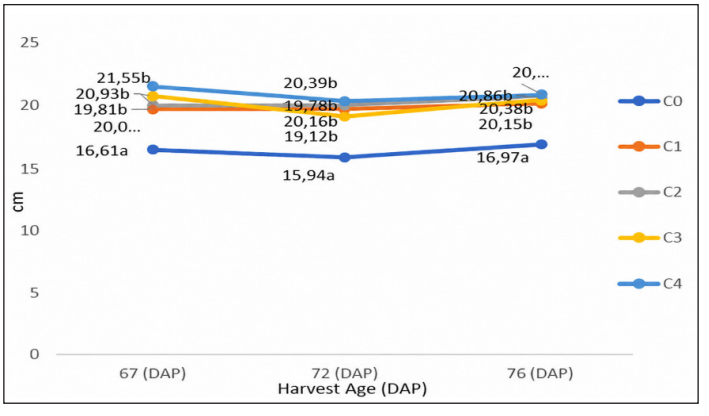

Figure 7. Shows the effect of cocopeat and chicken manure on Fruit Length. Numbers followed by different letters in the same chart are (DMRT) at $P \leq 0.05$

All amended treatments (C1-C4) resulted in longer fruits compared to the control (C0), which had the least fruit length at each observation. This pattern indicated that the plants without amendment had limited nutrient availability and less than optimal physical conditions for growth, resulting in a decrease in fruit elongation. (Sinaga et al., 2021), also reported similar findings where the size of eggplant fruits decreased when the substrates were nutrient deficient.

The longest fruits (19.7- 21.0 cm) were always produced by the highest doses of cocopeat- manure (especially C3 (75 g + 250 g manure) and C4 (100 g + 300 g manure). The better performance in these treatments is due to the improvement in soil structure, water-holding capacity and nutrient availability due to cocopeat and organic manure. Cocopeat is a well-documented effective growth medium due to its aeration and moisture retention properties (Adnan et al., 2025)and chicken manure is a readily available source of nitrogen, phosphorus and potassium essential for fruit development (Kahar, 2021).

Lower amendment levels could increase fruit elongation as compared to the control. Moderate fruit lengths obtained from C1 and C2 showed that fruit length was relatively stable across harvest ages in all treatments, which indicated that fruit elongation was determined early in fruit development, similar to the findings of (Maulida et al., 2022). In general, the combination of cocopeat and chicken manure considerably improved eggplant fruit length. The highest rates of amendment resulted in the most optimal results and supported its use as an organic growing medium to increase eggplant productivity.

Fruit Diameter

Based on the results of the ANOVA and 5% DMRT test, they are presented in Figure 8. The combination treatment of cocopeat with chicken manure significantly affected the Fruit Diameter, as demonstrated by the average Fruit Diameter of purple eggplant plants.

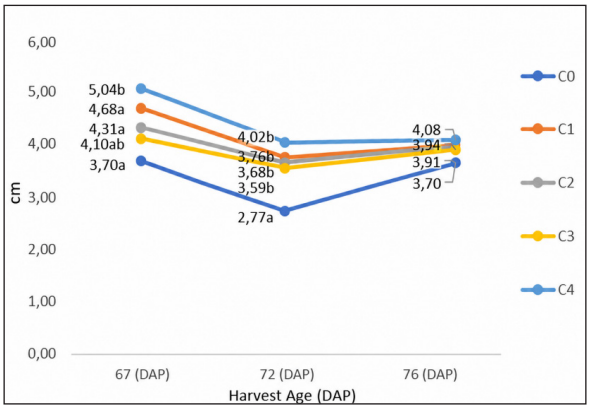

Figure 8. Shows the effect of cocopeat and chicken manure on fruit diameter. Values followed by different letters in the same chart are (DMRT) at $P \leq 0.05$

The chart shows fruit diameter of eggplant measured at 67, 72 and 76 DAP under different combinations of cocopeat-manure (C1-C4) compared with the control (C0). At 67 DAP, the fruit diameter was greater in all amended treatments (C1- C4) (4.31-5.04 cm) than in the control (3.70 cm), indicating that organic amendments improved early fruit expansion. The statistical separation (a, b) confirms the clear performance gap between the amended treatments and C0 and underlines the fact that improved soil aeration and nutrient availability stimulated early reproductive growth.

All treatments showed a reduction in fruit diameter at 72 DAP, which is commonly associated with increased fruit load and resource competition during mid-maturation. However, although this decrease was observed, the amended treatments (3.59-4.02 cm) still gave higher values than the control (2.77 cm). This confirmed that cocopeat- manure combinations still gave better fruit development during physiological stress. Fruit diameter increased again at 76 DAP in all treatments. Values stabilised at 3.91 to 4.17 cm for C1-C4, compared to 3.70 cm for the control. The constant superiority of the amended treatments suggests that the improved soil structure due to cocopeat and sustained nutrient release from manure promoted prolonged cell enlargement and fruit filling processes.

These results align with recent findings from Randi et al., (2023), who reported that organic amendments enhanced soil water retention, nutrient availability, and root-zone aeration. These factors directly improve fruit morphology. Studies indicate that cocopeat enhances porosity and water retention, whereas manure supplies necessary nutrients and stimulates microbial activity that aids nutrient mineralisation and fruit growth stability (Bahtiar et al., 2023). These synergistic effects account for the higher fruit diameters in C1-C4 compared to the unfertilised control. To summarise, the results show that the combination of cocopeat and manure significantly increases the diameter of eggplant fruits at all harvesting times, in agreement with the current literature which highlights the benefits of organic substrates on fruit size and quality.

Fruit Weight

They are presented in Figure 9, based on the results of ANOVA and the 5% DMRT test. The average fruit weight of purple eggplant plants under the combination treatment of cocopeat with chicken manure showed a significant effect on fruit weight.

The chart shows that the cocopeat-manure treatments (C1-C4) resulted in higher fruit weights than the control (C0) at all the harvest ages. At 67 DAP, the treated plants weighed 138- 156 g, which was significantly higher than the control (94.7 g), suggesting improved early fruit development. While all the treatments showed a decrease at 72 DAP, the amended groups (87- 102 g) performed better than the control (49.29 g), indicating better resilience during mid-cycle stress. At 76 DAP, fruit weights were recovered in all treatments, with C2-C4 having the highest weights (120-135 g), whereas the control was the lowest (83.03 g).

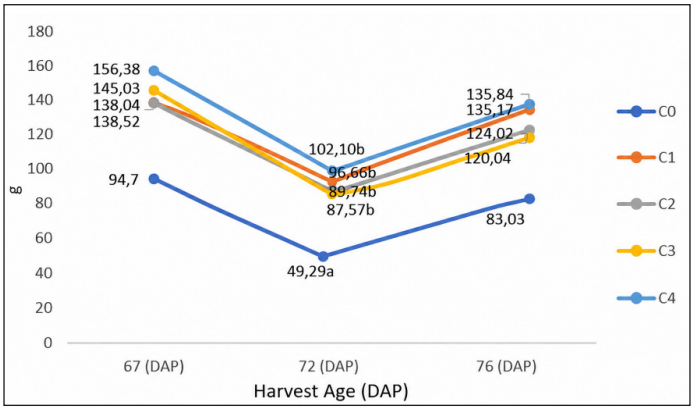

Figure 9. Effect of cocopeat and chicken manure on Fruit Weight. Values with different letters in the same chart differ (DMRT) at $P \leq 0.05$

These results indicate that the cocopeat with manure improves water retention, nutrient availability and aeration of the root zone, resulting in better fruit filling and overall yield. This trend is consistent with recent findings by Alhadi et al. (2021) that organic substrates enhance nutrient mineralisation, microbial activity and fruit biomass accumulation in eggplant and other solanaceous crops.

Interpretation of Treatment Responses

The results showed that applying a combination of cocopeat and chicken manure significantly affected vegetative growth and yield-related characteristics of purple eggplant (*Solanum melongena* L.). Among the five treatments evaluated, C4 (100 g cocopeat + 300 g chicken manure) generally showed high values for several measured parameters, including plant height, number of leaves, and selected fruit characteristics. However, responses differed among parameters and observation times. Thus, the results do not show a uniform dose-dependent increase of all growth and yield variables.

The observed responses may reflect the complementary roles of cocopeat and chicken manure. Cocopeat is widely used as a component of growing medium because of its water-holding capacity and its effect on the physical properties of the root zone. The chicken manure adds organic matter and plant nutrients. These properties offer plausible explanations for the differences identified among treatments. However, water-holding capacity, soil aeration, nutrient availability after application of the treatment, microbial activity and nutrient mineralisation were not directly measured in this experiment. Therefore, these mechanisms should be viewed as potential explanations rather than proven causes for the observed plant responses.

The number of leaves and the plant height generally increased during the observation period, but the degree of response depended on the treatment. The relatively high values

observed under C4 may suggest that this combination has provided favorable growing conditions under the experimental conditions. However, the responses should be interpreted from the statistical comparisons at each observation time and not simply from differences in the plotted means. In addition, repeated observations of the same plants have to be taken into account when evaluating treatment effects over time.

A similar caution is required for the reproductive responses. While C4 exhibited beneficial values for several fruit-related parameters, the magnitude and direction of treatment differences differed among harvest observations. Fruit number, length, diameter, and weight are all separate components of crop performance and should not be used interchangeably as measures of yield. For instance, a higher individual fruit weight does not automatically mean a higher total yield per plant if the number of fruits harvested and the total harvested mass are not taken into account too.

Furthermore, the experimental design assessed the mixtures of cocopeat and chicken manure, not the individual effects of each amendment. However, the quantities of both materials increase in parallel from C1-C4, so the effects of either can't be separated, nor can any interactions between the two. The experiment thus identifies treatment combinations linked to particular plant responses but does not establish whether cocopeat, chicken manure or their interaction was chiefly responsible for those responses.

The overall results indicate that the mixture of cocopeat and chicken manure could be a promising approach for the improvement of some growth and yield-related characteristics of purple eggplant. The evidence, however, is limited to the treatment combinations, experimental site and growing period studied. Further experiments should involve separate cocopeat and manure treatments, proper fertiliser controls, additional independent replication, and direct measurements of growing medium properties to elucidate the mechanisms underlying the observed responses and to define an agronomically and economically optimal amendment rate.

CONCLUSION

The study revealed that vegetative growth and yield-related characters of purple eggplant were associated with different combinations of cocopeat and chicken manure. The treatment C4 (100 g cocopeat + 300 g chicken manure) was generally promising for the responses of several parameters measured among the treatments evaluated. But the responses to the treatment were different for different parameters and times of observation, and the existing results do not confirm a uniform dose-dependent increase in all growth and yield variables.

The results suggest that the combination of cocopeat and chicken manure could be used as an organic growing-medium amendment for the production of eggplant. However, the effects of the single amendments and their interaction cannot be separated because both application rates were increased at the same time. The processes of water holding, aeration, nutrient availability and microbial activity were also not measured directly. The

results should thus be taken in light of the experimental conditions and not as evidence of a universally optimal treatment.

Further research should evaluate cocopeat and chicken manure alone and in combination, include appropriate unfertilised and standard-fertiliser controls, and use adequate independent replication across multiple locations and growing seasons. Direct measurements of growing-medium properties, nutrient availability, total yield per plant and production costs would strengthen the assessment of treatment effectiveness and support the development of evidence-based recommendations for sustainable eggplant production.

LIMITATIONS OF THE STUDY

When interpreting the findings, several limitations should be taken into account. First, the experiment was carried out at one experimental site and one growing period, May- July 2022. Hence, the results obtained may not be fully representative of responses in other soil conditions, climatic environments or growing seasons.

Second, the experiment was performed in three blocks, and three polybags were considered for each treatment-by-block unit. The statistical independence of the polybags should be interpreted in the light of the actual randomisation procedure. If the polybags in a treatment-by-block unit received the same treatment without independent randomisation, then they are subsamples and not independent experimental replicates. This distinction matters for estimating experimental variability and assessing the reliability of treatment comparisons.

Third, treatments were combined applications of cocopeat and chicken manure with both amendment rates increased together. The experiment did not include separate cocopeat-only and chicken-manure-only treatments, nor a standard-fertiliser control. Thus, the individual effects of the two amendments, their interaction, and their relative efficacy compared with conventional fertilisation could not be established.

Fourth, some of the proposed mechanisms to explain the observed plant responses, including changes in water retention, aeration, nutrient availability, microbial activity, and nutrient release, were not directly measured after amendment application. These mechanisms provide plausible explanations, but require further experimental validation.

Finally, the responses to the treatments were different for growth and yield parameters and harvest dates. Therefore, the reported findings need to be interpreted using validated raw data, proper statistical analyses and explicit yield measurements. Future studies should include independent replication, multiple locations and growing seasons, separate amendment treatments, standard-fertiliser controls, and direct measurements of soil and growing-medium properties. These enhancements would offer a stronger basis for determining treatment efficacy, agronomic optimum rates, and practical suggestions for eggplant cultivation.

REFERENCES

Adnan, N., Supian, M., Akpi, U. K., Francis, F., Nazir, M. Y. M., & Zaini, N. A. M. (2025). Bacterial cellulose from young coconut husk fibre hydrolysate as sustainable biomaterial. *International Food Research Journal*, *32*(4), 1174-1185

Adnan, Sondakh, R., & Alfin, M. (2023). Pengaruh kombinasi mulsa dan pupuk kandang terhadap tanaman bawang merah [The effect of mulch and manure combination on shallot plants]. *SCIENTIA: Journal of Multi Disciplinary Sciences*, *2*(2), 61-71. https://doi.org/10.62394/scientia.v2i2.55

Alhadi, B., Jamilah, J., & Hadi, A. (2021). Perlakuan sistem olah tanah dan aplikasi urin sapi terhadap pertumbuhan dan hasil tanaman terung ungu (*Solanum melongen*a L.) [Tillage system treatment and application of cow urine on the growth and yield of purple eggplant (*Solanum melongena* L.)]. *Jurnal Agroristek*, *4*(1), 6-11. https://doi.org/10.47647/jar.v4i1.407

Ardi, A., & Nuraeni, N. (2023). Pertumbuhan dan hasil tanaman seledri (Apium graveolens L.) pada pemberian pupuk organik cair [Growth and yield of celery plants (Apium graveolens L.) with liquid organic fertiliser application]. *Agrotekbis: E-Jurnal Ilmu Pertanian*, *11*(4), 972-980. https://doi.org/10.22487/agrotekbis.v11i4.1819

Bahtiar, Wasi'an, & Palupi, T. (2023). Upaya peningkatan hasil bawang merah pada tanah alluvial melalui penambahan pupuk kandang ayam dan cocopeat [Efforts to increase shallot yield in alluvial soil through the addition of chicken manure and cocopeat]. *Agrofood*, *5*(1), 12-18. https://doi.org/10.63848/agf.v05n1.2

Fernanda, Y. F., Hidayat, R., & Pribadi, D. U. (2025). Biofertiliser application of rabbit urine and eggshell powder improves purple eggplant (*Solanum melongena* L.) productivity under tropical field conditions. *Jurnal Pembelajaran dan Biologi Nukleus*, *11*(3), 1119- 1136. https://doi.org/10.36987/jpbn.v11i3.7766

Fitrianti, F., Almujihad, A., & Aliyah, M. (2023). Uji efektivitas pemberian komposisi media tanam dan aplikasi POC NASA terhadap pertumbuhan dan hasil tanaman seledri (*Apium graveolens* L.) [Effectiveness of planting media composition and NASA liquid organic fertiliser application on the growth and yield of celery (*Apium graveolens* L.)]. *Journal Peqguruang: Conference Series*, *5*(1), 1-4. https://doi.org/10.35329/jp.v5i1.3949

Kahar, K. (2021). Respon pertumbuhan dan hasil beberapa varietas tanaman tomat (S*olanum lycopersicum* L.) akibat pemberian jenis pupuk kandang [Growth and yield response of several tomato varieties (*Solanum lycopersicum* L.) to different types of manure]. *JAGO TOLIS : Jurnal Agrokompleks Tolis*, *1*(3), 60-65. https://doi.org/10.56630/jago.v1i3.164

Kamaluddin, N. N., Hindersah, R., Cahayaningrum, D. N., Purba, P. S. J., Wibawa, D. I., & Setiawati, M. R. (2022). Karakterisasi media tanam dari kombinasi cocopeat dan pupuk kandang ayam Karakterisasi media tanam dari kombinasi cocopeat dan pupuk kandang ayam [Characterisation of planting media from a combination of cocopeat and chicken manure]. *Soilrens*, *20*(1), 16-24. https://doi.org/10.24198/soilrens.v20i1.41352

Kartika, Y., Rosmaiti, R., & Syukri, S. (2024). Efektivitas penggunaan berbagai jenis pupuk kompos terhadap pertumbuhan dan produksi tanaman terung (*Solanum melongena* L.) [Effectiveness of different types of compost on the growth and production of eggplant (*Solanum melongena* L.)]. *Tumbuhan : Publikasi Ilmu Sosiologi Pertanian Dan Ilmu Kehutanan*, *1*(3), 39-56. https://doi.org/10.62951/tumbuhan.v2i1.246

Liu, Q., Chen, Z., Huang, L., Mujtaba Munir, M. A., Wu, Y., Wang, Q., Ma, L., Xu, S., Wen, Z., & Feng, Y. (2021). The effects of a combined amendment on growth, cadmium adsorption by five fruit vegetables, and soil fertility in contaminated greenhouse under rotation system. *Chemosphere*, *285,* Article 131499. https://doi.org/10.1016/j.chemosphere.2021.131499

Lukman, L., & Kusrianty, N. (2021). Kombinasi penggunaan kompos eceng gondok (*Eichhornia crassipes*) dengan pupuk kandang ayam terhadap laju pertumbuhan bibit tanaman kopi robusta (*Coffea canephora*) [Combination of water hyacinth compost (*Eichhornia crassipes*) and chicken manure on the growth rate of robusta coffee seedlings (*Coffea canephora*)]. *JST (Jurnal Sains dan Teknologi)*, *10*(2), 200-210. https://doi.org/10.23887/jstundiksha.v10i2.37615

Mansurat, A. I., Dandago, M. A., & Diya'udeen, H. B. (2023). Phytochemical contents and antioxidant potentials of eggplants from Kano State, Nigeria: A review. *Dutse Journal of Pure and Applied Sciences, 9*(1a), 160-167. https://doi.org/10.4314/dujopas.v9i1a.16

Lamasika, G., Musa, N., & Zakaria, F. (2024). Pengaruh komposisi media tanam dan konsentrasi pemberian pupuk organik cair bonggol pisang terhadap petumbuhan dan hasil tanaman tomat (*Solanum lycopersicum* L.) [Effect of planting media composition and liquid organic fertiliser concentration from banana corms on the growth and yield of tomato plants (*Solanum lycopersicum* L.)]. *Jurnal Lahan Pertanian Tropis*, *3*(2). https://doi.org/10.37159/jpa.v24i3.2185

Mostfa, Z. A., Alsawaf, A., Al-Rubaie, O. A. F., Saadi, A. M., Al-Chalabi, A. T. M., & Al-Zuhairi, F. F. A. (2025). Effects of organic and amino acid fertilisation on growth and yield of eggplant (*Solanum melongena* L.). *Organic Farming*, *11*(2), 127-134. https://doi.org/10.56578/of110205

Nasution, Y., & Tammin T. P. (2022). Pengaruh media tanam sabut kelapa (cocopeat) dan pupuk kandang terhadap pertumbuhan dan produksi tanaman cabai rawit [Effect of cocopeat growing medium and manure on the growth and production of bird's eye chilli]. *Jurnal Ilmiah Hijau Cendekia*, *7*(1), 41-45. https://doi.org/10.32503/hijau.v7i1.2257

Panjaitan, E., Sianturi, P. L. L., Sidauruk, L., & Manurung, E. Y. (2023). The effect of liquid organic fertiliser and solid organic fertiliser on the growth and production of eggplant (*Solanum melongena* L.). *Jurnal Kajian dan Penalaran Ilmu Manajemen*, *1*(3), 185-199. https://doi.org/10.59031/jkpim.v1i3.210

Poliquit, D. E. (2025). Growth and yield performance of eggplant (*Solanum melongena* L.) under bat guano tea application in potted conditions. *Thai Journal of Agricultural Science*, *58*(4), 344-360. https://doi.org/10.65764/tjas.2025.267405

Putra, M., Raksun, A., & Sedijani, P. (2025). Effect of NPK fertiliser and vermicompost on the vegetative growth of green eggplant (*Solanum melongena* L.). *Jurnal Biologi Tropis*, *25*(1), 199-210. https://doi.org/10.29303/jbt.v25i1.7861

Ramadhan, R. G., Adam, D. H., Elizabeth Mustamu, N., & Walida, H. (2024). Increasing the growth and production of eggplant (Solanum melongena L.) by providing wood biochar. *Jurnal Agronomi Tanaman Tropika (JUATIKA)*, *6*(2), 616-621. https://doi.org/10.36378/juatika.v6i2.3660

Randi, R., Rahmidiyani, R., & Zulfita, D. (2023). Pengaruh tepung cangkang telur dan pupuk NPK terhadap pertumbuhan dan hasil terung pada tanah gambut [Effect of eggshell powder and NPK fertiliser on eggplant growth and yield in peat soil]. *Jurnal Sains Pertanian Equator*, *12*(3), 676-687. https://doi.org/10.26418/jspe.v12i3.64902

Sanyang, S. E, Demba, S., & Njie, E. (2025). Growth performance of eggplant (*Solanum melongena* L.) enhanced by watering intervals and application of organic manure. *International Journal of Applied Agricultural Sciences*, *11*(1), 24-28. https://doi.org/10.11648/j.ijaas.20251101.13

Shafira, W., Akbar, A. A., & Saziati, O. (2021). Penggunaan cocopeat sebagai pengganti topsoil dalam upaya perbaikan kualitas lingkungan di lahan pascatambang di Desa Toba, Kabupaten Sanggau [Use of cocopeat as a substitute for topsoil to improve environmental quality in post-mining land in Toba Village, Sanggau Regency]. *Jurnal Ilmu Lingkungan*, *19*(2), 432- 443. https://doi.org/10.14710/jil.19.2.432-443

Shintiavira, H., Dewanti, M., Rachmawati, F., Nurlaeni, Y., Nurdina, D., Sadli, S., Ariyantika, S., & Kartikaningrum, S. (2023). Cocopeat perlite mixture as an alternative for rooted cuttings growth medium of *Impatiens hawkeri x platypetala* in Indonesia. *Caraka Tani: Journal of Sustainable Agriculture*, *38*(2), 359-370. https://doi.org/10.20961/carakatani.v38i2.73876

Sinaga, E. E., Dahang, D., & Tarigan, S. (2021). Pengaruh kombinasi pupuk kandang ayam dan pupuk kandang sapi terhadap pertumbuhan dan produksi tanaman bawang merah (*Allium ascalonicum* L.) varietas Batu Ijo [Effect of a combination of chicken manure and cow manure on the growth and production of Batu Ijo shallot (*Allium ascalonicum* L.)]. *Jurnal Agroteknosains*, *5*(1), 11-23.

Wasis, B., & Fitriani, A. S. (2022). Pengaruh pemberian pupuk kandang sapi dan cocopeat terhadap pertumbuhan *Falcataria moluccana* pada media tanah tercemar oli bekas [Effect of cow manure and cocopeat on the growth of *Falcataria moluccana* in soil contaminated with used oil]. *Journal of Tropical Silviculture*, *13*(03), 198-207. https://doi.org/10.29244/j-siltrop.13.03.198-207

Yanti, M., Setiono, & Subagiono. (2025). Pengaruh media tanam sabut kelapa (cocopeat) dan pupuk kandang kotoran ayam terhadap pertumbuhan dan hasil cabai rawit (*Capsicum frutescens* L.) varietas ORI 212 [Effect of cocopeat growing medium and chicken manure on the growth and yield of ORI 212 bird's eye chilli (*Capsicum frutescens* L.)]. *Jurnal Greenation Pertanian Dan Perkebunan*, *3*(4), 212-230. https://doi.org/10.38035/jgpp.v3i4.724