

INFLUENCE OF COW AND PIG MANURE APPLICATION ON GROWTH PERFORMANCE OF EGGPLANT (*SOLANUM MELONGENA* L.)

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ABSTRACT

*This study looked at the comparative efficiency of organic amendments in the reproductive and vegetative productivity of eggplant (*Solanum melongena*). By combining a variety of methods, the researchers used an experimental setup to measure the growth parameters. At the same time, a qualitative model based on Braun and Clarke's thematic analysis was used to understand the plants' health and the environmental factors from the observational narratives. Whereas the control group yielded the maximum vegetative growth by leaf number, the rest of the findings suggested that cow manure was the most effective treatment in terms of total productivity, as it produced the tallest plants (25 inches), the best flower stability, and the largest fruit yield (9 fruits). Statistical testing showed that cow manure improved the reproduction rate drastically as compared to the control ($p=0.02$) and pig manure ($p=0.00$), whereas pig manure did not bring about any significant benefits. From the qualitative standpoint, the observation records showed that the plants without manure were in poor leaf condition, being dry and having holes, on the other hand, the manured plots of land flowered earlier and were more resistant. Moreover, these environmental factors (heavy rain and strong sunshine) were described by the farmers as "double, edged swords" in that they allow growth on the one hand but cause leaching of nutrients and abiotic stress on the other. The use of cow manure is strongly suggested to the farmers if they want to get the best marketable fruit yield. Subsequent studies could probe into a "hybrid" management approach that is based on the use of natural soil nutrients during the initial vegetative phases.*

Keywords: Eggplant (*Solanum Melongena* L.) Cow, and Pig Manure

INTRODUCTION

This study examined how applying cow and pig manure affects the growth performance of eggplants. Eggplant is often the main crop grown by smallholder farmers, who use it as a food source and a source of income. However, because artificial fertilizers are not easily accessible, the output is often inadequate. To encourage crop development, organic fertilizers such as cow and pig manure must be used. This study investigated the effects of these two types of manure on eggplant development and productivity in order to provide farmers with pertinent advice. Extensive studies documented in the literature have demonstrated that the addition of organic amendments significantly boosts both crop productivity and soil health. Zhang et al. (2020) documented that the application of cow manure leads to an increase in bacterial diversity, a factor which along with others have been linked to the attainment of higher yields in peanut, sweet corn (Aprilia Ike Nurmalasari et al., 2024), and soybean (Budianta et al., 2022) crops. Pig manure and bokashi are among the various eco, friendly methods that are used as a replacement for chemical fertilizers that, aside from decreasing soil acidity, also help in the growth of eggplant (Ziraluo, 2020; Luoe et al., 2023). Nevertheless, the association of organic and inorganic sources in nutrient management still results in a considerable boost in the yield of maize and eggplant (Suge, 2013; Salingay et al., 2024). In the Philippines, where eggplant farming constitutes an essential source of income, pest problems are solved through eco, friendly methods and biotechnological applications such as Bt eggplant (Hautea et al. , 2016). Besides, post, harvest processing and the use of highly nutritious waste products like antioxidant, rich peels not only highlight the potential of the eggplant. To maintain improvements in crop quality, pest resistance, and productivity, such breeding innovations are crucial. The effectiveness of cow and pig manure as fertilizers on the growth and yield of *Solanum melongena* L. (eggplant) is examined in this study. This study demonstrates how to fertilize eggplant plants with cow and pig dung. Small farmers will be able to avoid using artificial fertilizers thanks to this. Farmers will be better able to do research on organic fertilizers if they avoid using chemicals.

RESEARCH PROBLEM

The researchers aimed to determine the effectiveness of cow and pig manure on the growth performance of eggplant growth and development. Specifically, this sought answers to the following questions:

OBJECTIVES:

1. How may the effectiveness of cow manure, pig manure, control group on eggplant growth production be describe in terms of: height; number of leaves, number of flowers; and number of fruits?
2. Is there a significant difference between the cow manure, pig manure, and control group in eggplant growth production?
3. How do manure and non-manure treatments differ in their ability to maintain plant height and biomass when subjected to the physical stress of excessive rainfall?

HYPOTHESIS

There is no significant difference between the cow manure and pig manure treatments on the growth performance of eggplant according to height, number of leaves, and number of fruits.

MATERIAL AND METHODS

Apart from this experimental study was to figuring out the impact of organic fertilizers on *Solanum melongena* L. (Eggplant). The setting up of the experiment was done with Randomized Complete Block Design (RCBD) with six replications. The use of three treatments only was made: control (T0), 1kg of cow manure (T1), and 1kg of pig manure (T2). The experimental work was done from June to September 2025 in Magalang, Pampanga-Philippines. The fertilization was done by pouring at 7, 14, and 20 days after transplanting (DAT). The main growth parameters that were measured prepared apparently are leaf area, crop growth rate, and fruit weight. The seedlings were raised for transplanting for 30 days, and at 20 DAT the first harvest was made on the basis of color and texture of the fruit.

STATISTICAL TREATMENT AND DATA ANALYSIS

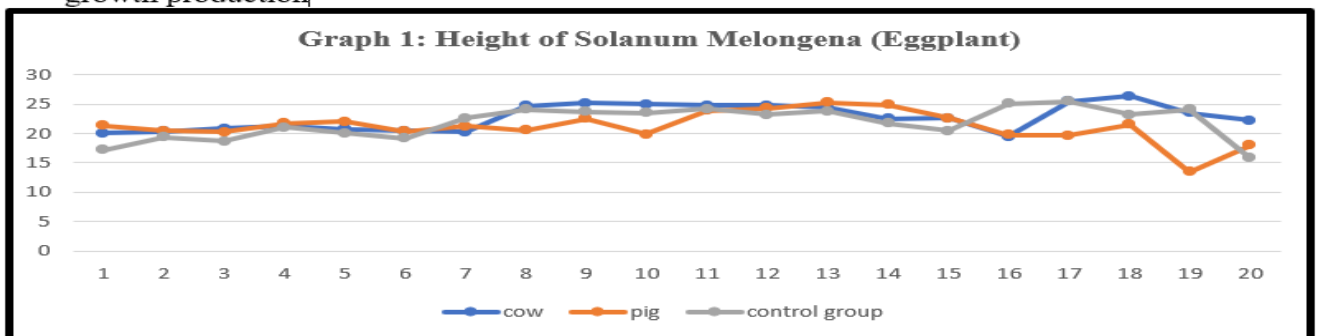
The research used a mixed, methods approach to study the growth of eggplants under different conditions. The numerical data were handled by Excel and one, way ANOVA which revealed significant variations in the height and weight at the 0.05 alpha level. From the qualitative aspect, Braun and Clarkes thematic analysis connected these statistical findings with the literature, thus giving a more in, depth understanding of nutrient effectiveness and surprising growth patterns.

RESULTS

The graph shows the height variations of *Solanum Melongena* (eggplant) plants treated with different substances: cow, pig and a control group. Overall, the cow manure showed all the height

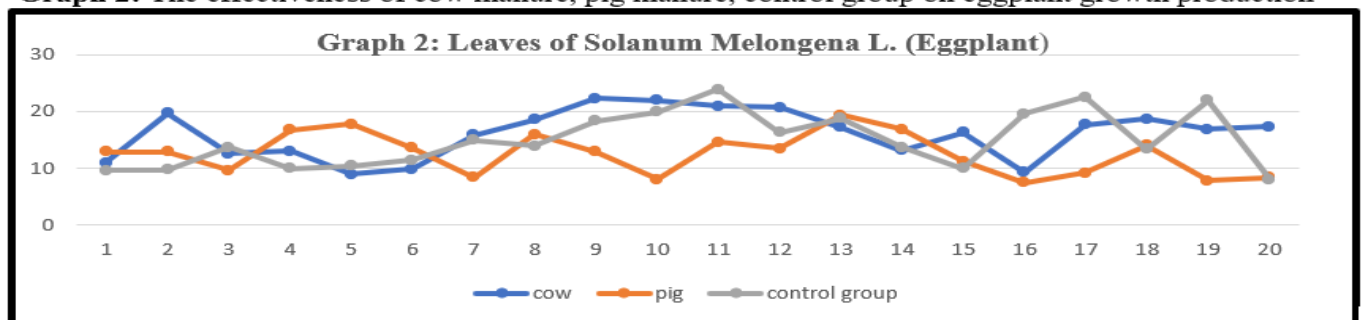
increases, reaching approximately 25 inches. The pig treatment also showed similar height values but with more variation especially towards the end of the period. The control group remained at a relatively constant height, slightly lower than the manure treatments. The data indicates that cow manure leads to the highest and most fluctuating plant heights in *Solanum Melongena* (eggplant) plants. This study supported by (Saputri et al., 2022). Showing cow manure is rich in essential macro-nutrients (Nitrogen (N), Phosphorus (P), Potassium (K) and organic matter, enhancing soil fertility and promoting vegetative growth, including plant height.

Graph 1: The effectiveness of cow manure, pig manure, control group on eggplant growth production



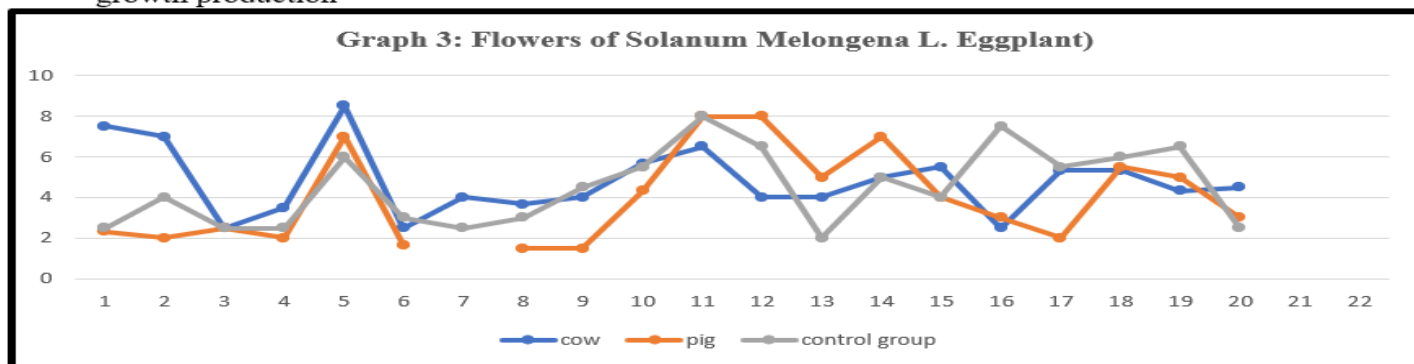
The research compared the effects of cow manure, pig manure, and a control on the number of leaves of eggplant. Unexpectedly, the control group showed the highest vegetative growth with a maximum of 25 leaves, and pig manure was the lowest performer throughout the experiment. Cow manure gave an average result, being notably the best during the middle growth period. Generally, manure releases nitrogen to the plants which results in vigorous vegetative growth; however, the researchers present the hypothesis that the nutrients already available in the control soil and/or the potential negative effects of the raw manure might be responsible for these results. On the other hand, the current literature has consistently documented that cow manure could be effective in significantly increasing the number of leaves through its combined effects of changing the soil physical properties as well as improved nutrient availability (Abegunrin et al. , 2016).

Graph 2: The effectiveness of cow manure, pig manure, control group on eggplant growth production



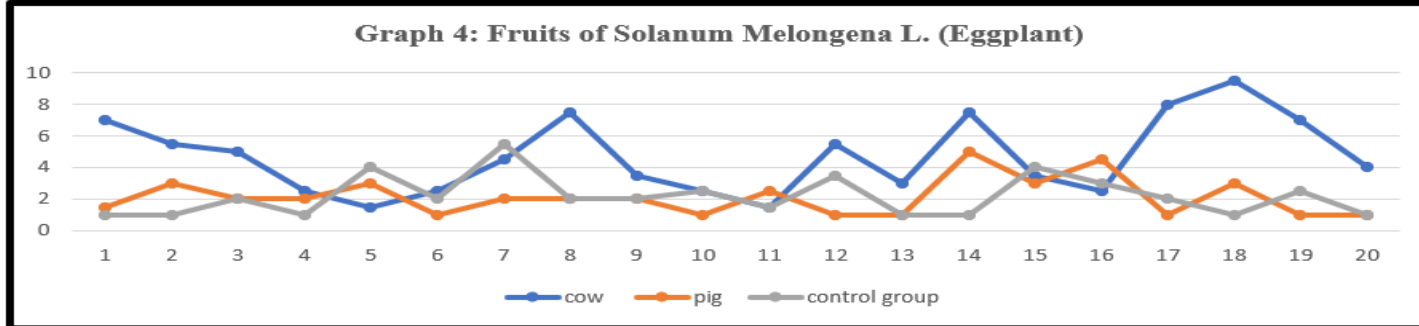
The graph shows the effectiveness of cow manure, pig manure and control group on the number of flowers produced by *Solanum Melongena L.* (eggplant). The cow manure produces more flowers, especially at the beginning and around the middle of the observation period, where the numbers of flowers reached its highest point. The pig manure also showed an increase in flower production, but the results were less stable and went up and down more often. Meanwhile, the control group, which did not receive any manure, consistently had fewer flowers compared to the other two treatments. The data showing the cow manure treatment leading to the highest number of flowers is consistent with studies on the use of cow manure for vegetable production. Cow manure is known to be rich in organic matter and nutrients like Phosphorus (P) and Potassium (K), which are crucial for enhancing plant reproductive processes like flowering and fruiting (Singh & Singh, 2021).

Graph 3: The effectiveness of cow manure, pig manure, control group on eggplant growth production



The graph shows the fruit count variations of eggplant plants treated with different substances: cow, pig, and a control group. Overall, the cow treatment led to the highest and most fluctuating fruit counts, with several peaks reaching above 7 units, including a maximum of 9 fruits at period 18. The pig treatment showed moderate and highly variable fruit counts, exhibiting high variability but generally maintaining levels above the control. The control group consistently maintained the lowest fruit count, mostly below 4 units, indicating minimal productivity compared to the treated groups. This suggests that the cow treatment may be the most effective in promoting the fruit production of eggplant, while the pig treatment had less consistent results, and the control group's minimal change confirms that the treatments contributed to growth. The data showing the cow treatment leading to the highest fruit count is consistent with numerous studies on the use of animal manure as an organic fertilizer for crops, as cow manure is known to be rich in macronutrients and organic matter which collectively enhance soil fertility, promoting reproductive growth and fruit yield (Abegunrin et al., 2016; Tchiaze et al., 2021).

Graph 4: The effectiveness of cow manure, pig manure, control group on eggplant growth production



The data reveals the impact of different treatments on plant characteristics based on p-values. When comparing the Control Group to Cow Manure, there is a significant difference in the number of fruits ($p = 0.02$). Similarly, when comparing Cow Manure to Pig Manure, there are significant differences in both the number of flowers ($p = 0.04$) and fruits ($p = 0.00$). However, there are no significant differences in height, leaves, or flowers when comparing Pig Manure to the Control Group. Additionally, there are no significant differences in height or leaves between the Control Group and Cow Manure, or between Cow Manure and Pig Manure.

Table 1. Significant difference between the cow manure, pig manure, and control group in eggplant growth production

Treatment	P-value			
	Height	Leaves	Flowers	Fruits
Pig Manure vs. Control Group	0.90	0.80	0.17	0.49
Control Group vs Cow Manure	0.69	0.27	0.34	0.02*
Cow Manure vs Pig Manure	0.46	0.18	0.04*	0.00*

Legend: * Significant

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Description on manure and non-manure treatments in Crop Production

Based on the researcher’s analysis of the plant production, the participants remarked that the plots treated with animal manure showed better growth and earlier flowering than the plots without

manure, thus emphasizing the positive effect of fertilizer in providing nutrients and improving soil structure. It was however observed that the non, manured plants had a higher number of leaves but these leaves were often dry or had holes indicating the plants were under stress; thus, the quantity of leaves is not a reliable indicator of plant health. The climatic elements had both positive and negative impacts: sufficient rain invigorated the plants while excessive rainfall turned the soil muddy, carried away the nutrients and favored the growth of weeds. Besides that, both the living organisms and the non, living environmental factors caused the plants to be stressed in different ways; for instance, the ladybugs first attacked and then the extremely hot sun left the leaves burnt. In conclusion, these results convey that although plants may continue growing without help, their best performance, healthy, robust crops, is a result of a well, planned mix of organic fertilization, timely weed control, and shelter from harsh weather conditions.

DICUSSION

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CONCLUSION

Data revealed that although plants can live without anyone's help, top growth performance is only achieved through well, planned interventions. Besides organic manure being vital for the rapid development of flower and shoot, the study also found that it improved the soil texture. However, the research has disproved the "leaf count" theory; under non, manured care, more leaves were produced but their poor quality was a clear indication of the plant suffering from lack of nutrients.

Success undoubtedly depends on the control of the environment as well. What may initially be a beneficent rain, after all, becomes a source of harm through nutrient leaching while ladybugs and severe heat are additional factors which cause a decline in plant health. In the final analysis, a balanced nutrient, rich diet, coupled with competent weed management and the provision of a suitable living environment, is what farming at its best is all about.

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