

## A COMPARATIVE ANALYSIS OF PIGEON-CHICKEN MANURE MIXTURE AND MADRE DE CACAO MANURE ON GREEN CHILI (*CAPSICUM ANNUUM*) PRODUCTION

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### ABSTRACT

*This study is the grow and yield of green chili (*Capsicum annuum*) under four different treatments: chicken/pigeon manure, Madre de Cacao, and the control group. The results make it very clear that poultry manure is the best fertilizer by far, which is reflected in the significantly higher fruit numbers (8 to 12) and taller plants (16 to 18 inches) associated with this treatment. As a "turbocharger" poultry manure was found to speed up the flowering and the reproductive phases while Madre de Cacao was credited with enhancing the structural strength and plant longevity. Despite the soil being very fertile, a qualitative survey of the field showed that environmental factors such as heavy rainfall, weed competition, and human and animal disturbances led to premature fruit drop. The research concluded that farmers could obtain the highest yield by using properly composted poultry manure. It is suggested that animal and plant organics both be used: this means using Madre de Cacao as a structural mulch and poultry manure as a reproductive enhancer thus creating a good balance between strong plants and high productivity.*

**Keywords:** Green Chili (*Capsicum annuum*), Madre de Cacao, Pigeon-chicken Manure Mixture

## INTRODUCTION

This study explored the mixture of dove manure, chicken manure, and madre cocoa. The major objective of the research is to evaluate the effects of manures on green chilies (*capsicum annum*). Also, the study was intended to identify the various problems that may hamper the cultivation of green chilies such as pests, weather, and the growing environment. Recent research has revealed that organic fertilizers are capable of enhancing not only the crop productivity but also the soil quality as a whole. Among different organic materials like pigeon manure, it has been discovered that chicken manure is the one that most effectively lessens nematode damage on pinto beans (Heidari et al., 2019), and additionally, it raises the yields of mung beans (Sammah et al., 2025), cassava (Biratu et al., 2018), and cacao (Bias & Bucan, 2022). It is nutrient, rich and is beneficial in improving soil chemistry by increasing pH, nitrogen, phosphorus, and reducing cation exchange capacity, organic matter content, and heavy metal bioavailability (Alesna & Lina, 2022; Huang et al., 2020; Liu et al., 2021). Moreover, plant, based products like Madre de Cacao are helpful for environment, friendly rice farming and impact the traits of banana ripening (Ibanez et al., 2023; De Guzman et al., 2024). Summing up, the implementation of integrated nutrient management together with composted manures is an excellent step towards sustainable production and obtaining higher economic returns for farmers (Jibrin & Kris, 2019; Cera, 2023). This research attempted to find out which of the two organic fertilizers has a better nutrient supply capability for green chili plants growth and production. This helped the farmers to have significant information to decide whether to use pigeon chicken manure or madre de cacao manure for a higher green chili yield.

## RESEARCH PROBLEM

The researchers aimed to assess the effects of carabao manure, rice husk, and control group to the chili pepper production.

## OBJECTIVES

Specifically, this study sought answers to the following question

1. How may the effectiveness of the madre de cacao, chicken mixed with pigeon manure, and control group on the chili pepper production be described in terms of height; number of leaves number of flowers; and number of fruits?
2. Is there a significant difference among madre de cacao, chicken mixed with pigeon manure, and the control group?
3. How do organic fertilizers and external environmental factors interact to influence the growth, productivity, and survival of crops based on field observations?

## HYPOTHESIS

There is no significant difference among the madre de cacao, pigeon manure with chicken manure, and the control group.

## MATERIALS AND METHOD

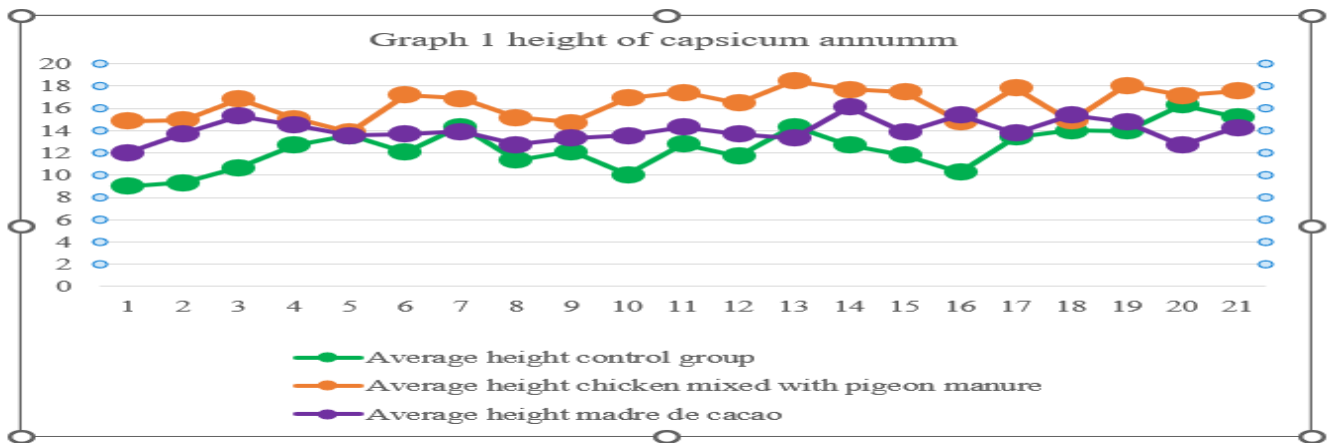
The study on the influence of organic fertilizers, specifically pigeon, chicken manure and madre de cacao leaves, on plant growth has been in progress from July 2005 until October 2025, as one of the research projects. The experiment was set up with three different treatment groups and 21 plants per plot were observed to record the changes in leaf count, plant height, and fruit production. The main achievement of the study was flower production, which was an indicator of a healthier and more mature plant.

## STATISTICAL TREATMENT AND DATA ANALYSIS

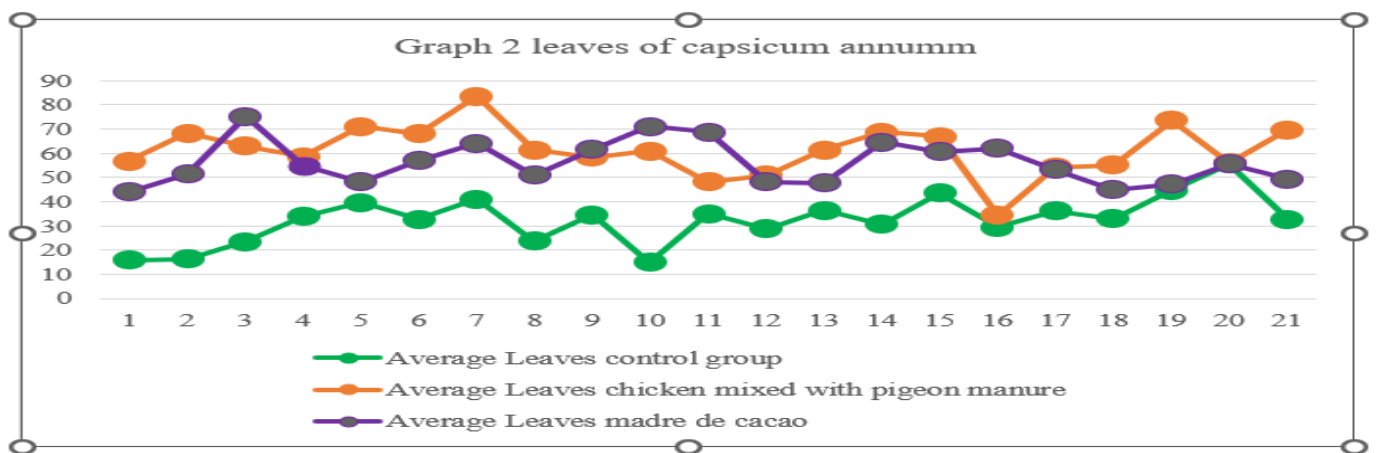
The researchers measured plant height and feed intake with the help of Excel and the mean formula. They also applied one, way ANOVA and Bonferroni tests at a 0.05 level of significance to determine the differences between the treatments. Furthermore, the study included Braun and Clarke's thematic analysis of narrative observations from preparation to harvest. These combined methodologies allowed them both statistical exactness and a qualitative understanding of the research process.

## RESULTS

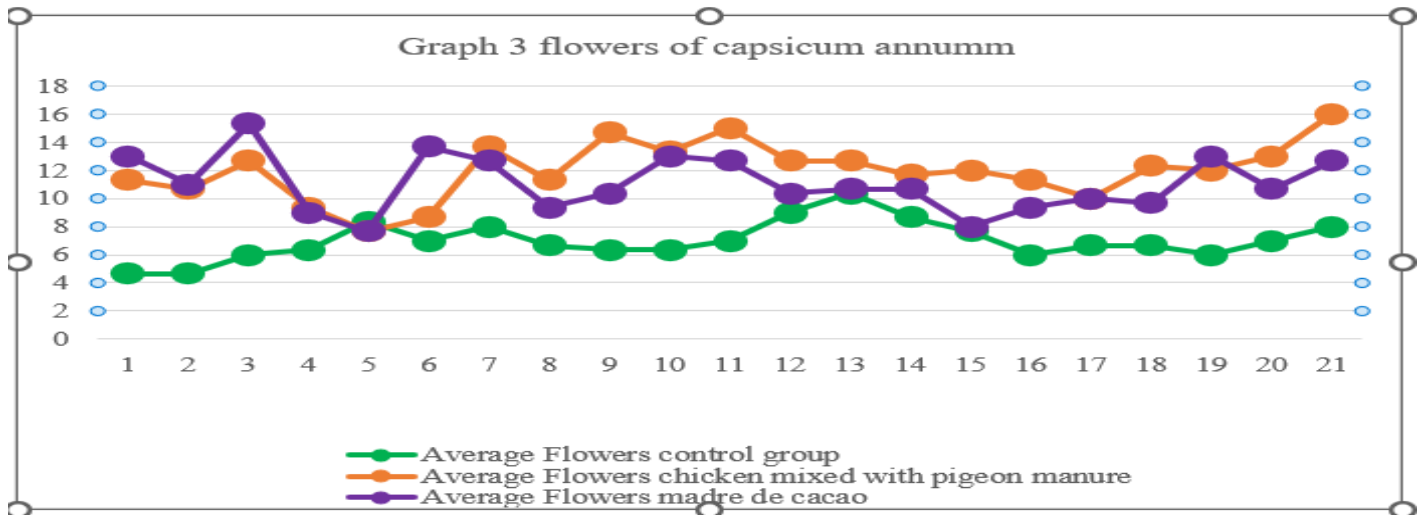
Graph 1 showed how the three treatments affect the capsicum annumm (green chili). Plants treated with chicken and pigeon manure have the highest effect on the height of green chili, reaching 16-18 inches. While plants treated with madre de cacao have the least effect reaching 14-16, and the control group has the lowest height, staying around 10-13 inches. The data showing the chicken mixed with pigeon manure treatment leading to the highest and most fluctuating plant heights is consistent with numerous studies on the use of chicken and pigeon manure as an organic fertilizer for Capsicum annumm (chili). Chicken and pigeon manure are both high in nitrogen and phosphorus, which makes the soil more fertile and helps plants grow taller (Alesna & Lina, 2022).



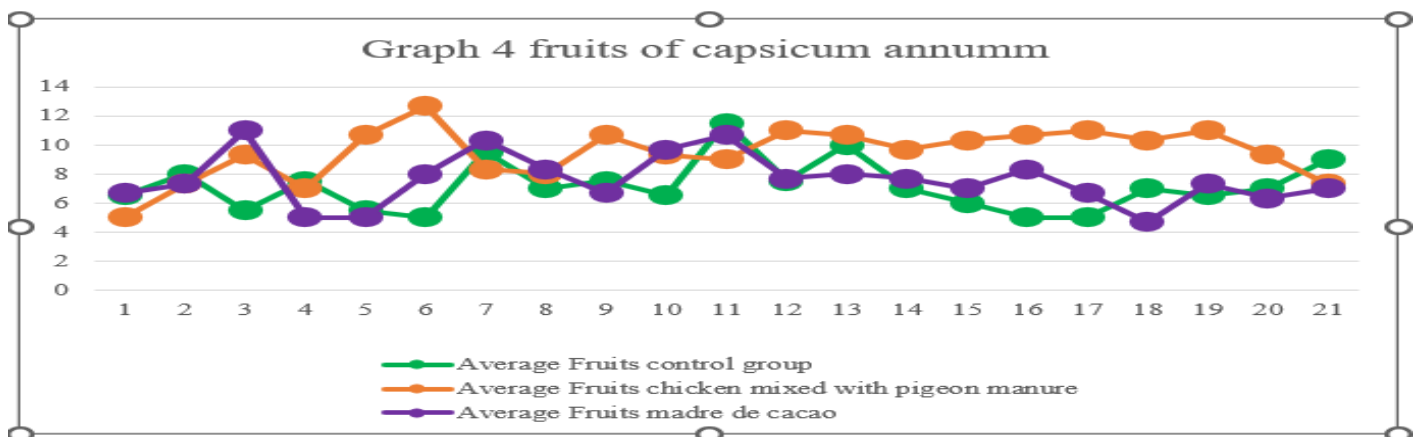
The graph shows the number of leaves under the three treatments. The plants treated with chicken and pigeon manure produced the highest number of leaves, reaching 70-80 leaves, while the madre de cacao treatment showed moderate results, reaching about 40-60 leaves, and the control group just produced 20-30 leaves. The data showing the chicken mixed with pigeon manure treatment produce the highest number of leaves, and there are numerous studies on the use of chicken and pigeon manure as an organic fertilizer for *Capsicum annumm* (pepper/chili). Chicken and pigeon manure is a good source of Nitrogen (N), phosphorus (P), and Potassium (K). Chicken manure enhances the growth of plant leaves and improves overall plant health (Daqi Zhang et al., 2020).



The graph shows the number of flowers under the three treatments. Plants treated with chicken and pigeon manure consistently produce 10 to 15 flowers, while plants treated with madre de cacao show moderate results, producing 8 to 12 flowers, and the control group has the lowest flower production, reaching 6 to 9 flowers. The data showing the chicken mixed with pigeon manure treatment produced the highest number of flowers, numerous studies on the use of chicken and pigeon manure as an organic fertilizer for *Capsicum annumm* (pepper/chili) plants. Pigeon manure, along with chicken manure, is rich in phosphorus, which improves the flowers of the plant (Adil Mihoub, et al., 2022).



The graph shows the average number of fruits produced by plants under three treatments. Plants given chicken and pigeon manure had the highest fruit yield, producing 8 to 12 fruits, while madre de cacao also increased fruit production but was less consistent, producing 5 to 10 fruits. The control group had the lowest fruit yield, indicating limited growth without fertilizer. The data show the chickens mixed with pigeon manure produced the highest number of fruits. According to Moniz & Dos Santos (2023), the application of chicken manure has a significant effect on the yield component.



Data shows that the combination of pigeon and chicken manure resulted in the most effective treatment among the tested options, especially in terms of plant height and fruit yield. Madre de Cacao as an organic alternative, however, did not bring statistically significant improvements compared with the control group in this particular study.

Treatment	p-Value			
	Height	Leaves	Flower	Fruit
Control group vs Mixed	3.33	7.90	6.20	0.05*
Control group vs Madre de cacao	0.06	2.03	6.22	0.95
Mixed vs Madre de cacao	0.00*	0.95	0.98	0.31

\*Significant

**Description on productivity, and survival of crops based on field observations.**

**Theme 1: Factors influencing crops growth and productivity**

The garden is now reaping the results of the mature plants, which after a nicely balanced supply of organic fertilizers and natural conditions, have evolved from survival to superb health. Evidence shows that there is amazing interaction between poultry manures which are considered growth "turbocharger" for height and flowering, and Madre de Cacao that marks the plants structural endurance and turns out to be the leading fruit yield performer. The recent heavy rains have not only quickened this development which has resulted in a strong harvest but they have also brought the problem of fast weed growth, thus demanding farm hands' attention to remain focused on the crops. The story ultimately demonstrates that a diversified natural fertilization approach consisting of a combination of nutrient, rich bird droppings and the stabilizing effect of Madre de Cacao leads to an extremely productive environment that can yield exceptional results.

**Theme 2: Environmental and operational challenges in crop production**

The garden finds itself at a major crossroads as both extreme weather and human activities have basically wiped out what was before a very vibrant patch of earth. The plants have literally been stormed by heavy rains and winds at gale speed, which has led to the breaking of the stalks, fruits falling down before their time and a kind of biological stress so strong that it has caused some plants to die. On top of these natural calamities, there has been damage due to foot traffic, with dogs trampling the ground and kids breaking the stalks, therefore the crops are feeling like they are dying. Such a time of difficulty has revealed how unprotected this initiative is, the attention being shifted from growth to recovery and the need for fencing as a first line of defense against further damage being a very urgent issue.

## DISCUSSION

The experimental data demonstrated that organic amendments led to significant improvements in both the vegetative and reproductive performance of *Capsicum annuum* over the control plants (unfertilized plants). The combined application of chicken and pigeon manure was the best treatment, invariably leading to the top results in plant height (16 to 18 inches), leaf count (70 to 80), and flower production (10 to 15). It is very likely that this "turbocharger" effect is due to the high levels of the three main macronutrients Nitrogen (N), Phosphorus (P), and Potassium (K) that are naturally present in poultry droppings and thus these nutrients can act as a source that rapidly accelerates metabolic processes. Madre de Cacao on the other hand was able to provide somewhat limited benefits particularly in leaf production and development, but it was less consistent in fruit yield compared to the poultry manure mixture. Still, the study points out that an organism's biological potential is largely constrained by environmental factors. Although the fertilizers provide nutrients that are very beneficial to the plants, factors such as heavy rains, strong winds, and trampling by foot traffic caused so much biological stress that the plants even experienced stalk breakage and fruit drop before they were mature. Hence, it appears that while organic fertilization can help the plants grow optimally, the yield in a crop is still susceptible to environmental factors if it is not protected by measures such as fencing.

## CONCLUSION

It is shown by the study that the use of various types of organic fertilizers, especially the nutrient-rich poultry manures, can significantly increase the growth and overall production of green chili plants. All growth parameters of green chili plants treated with chicken and pigeon manure were superior to those of plants treated with Madre de Cacao and the control group, thus confirming the excellent qualities of this type of organic fertilizer. Nevertheless, the progress from "bare survival to excellent health" is very unstable; external factors and operational issues, for example, severe weather and trampling, may eliminate the positive effects of nutrition. In the final analysis, high yields illustrating the pinnacle of growth need to be achieved through two-fold efforts: utilization of high, NPK organic amendments to stimulate growth on one hand and at the same time providing physical protection to crops to keep them from being damaged externally.

## REFERENCE

1. AD Jibrin, RL Anton Kris(2019) Journal of Agriprenurship and Sustainable Development 2 (2), 174-184  
[https://scholar.google.com/scholar?hl=en&as\\_sdt=0%2C5&q=jibrin+2019+chicken+manure&btnG=#d=gs\\_qabs&t=1768477080972&u=%23p%3D6lpOVytZGIIJ](https://scholar.google.com/scholar?hl=en&as_sdt=0%2C5&q=jibrin+2019+chicken+manure&btnG=#d=gs_qabs&t=1768477080972&u=%23p%3D6lpOVytZGIIJ)
2. Binas, E. J., & Bucan, F. T. . (2022). Growth Response of Cacao (Theobroma cacao L.) Varieties to Different Soil Amendments Combined With Inorganic Fertilizers. Journal of Current Opinion in Crop Science, 3(4), 177 <https://www.jcoocs.com/index.php/ej/article/view/187>
3. Daqi Zhang, Hongyan Cheng, Baoqiang Hao, Qingjie Li, Wensheng Fang, Lirui Ren, Dongdong Yan, Canbin Ouyang, Yuan Li, Qiuxia Wang, Xi Jin, Lin He, Aocheng Cao(2021)Protection146,105653.  
[https://scholar.google.com/scholar?q=daqi+zhang+2021&hl=en&as\\_sdt=0,5#d=gs\\_qabs&t=1768354197806&u=%23p%3DngoCfotBQzwJ](https://scholar.google.com/scholar?q=daqi+zhang+2021&hl=en&as_sdt=0,5#d=gs_qabs&t=1768354197806&u=%23p%3DngoCfotBQzwJ)
4. Gizachew Kebede Biratu, Eyasu Elias, Pheneas Ntawuruhunga, Nhamo Nhamo(2018) Agriculture 8 (4), 45. [https://scholar.google.com/scholar?hl=en&as\\_sdt=0%2C5&q=research+on+chicken+manure+on+soil&btnG=#d=gs\\_qabs&t=1768353387461&u=%23p%3DYMgH0vF8KYoJ](https://scholar.google.com/scholar?hl=en&as_sdt=0%2C5&q=research+on+chicken+manure+on+soil&btnG=#d=gs_qabs&t=1768353387461&u=%23p%3DYMgH0vF8KYoJ)
5. Heidari, F., Charehgani, H., Abdollahi M., & Adhami E. (2024). The effect of poultry and pigeon manures on pinto bean infection with the root-knot nematode *Meloidogyne javanica*. Plant Pathology Science, 13(1), 1-13
6. Jeffrey G Dichoso, Elmar M Villota, Jonathan V Fabulac, Vitaliana U Malamug(2025) Asian Journal of Agriculture and Rural Development 15 (1), 94.  
[https://scholar.google.com/scholar?hl=en&as\\_sdt=0%2C5&q=applying+chick](https://scholar.google.com/scholar?hl=en&as_sdt=0%2C5&q=applying+chick)
7. Lauren, C. P. (2019). Development of organic fertilizer products and systems to improve soil fertility of organic vegetable production of cabbage in Benguet, Philippines. Mountain Journal of Science and Interdisciplinary Research, 79(1), 6–16. ISSN 2619-7855.
8. Lita B Cera(2022) International Journal of Advances in Social and Economics 4 (2), 50-56  
[https://scholar.google.com/scholar?hl=en&as\\_sdt=0%2C5&q=cera+2022+chicken+manure&btnG=#d=gs\\_qabs&t=1768477231744&u=%23p%3Dvk5CZLCruKQJ](https://scholar.google.com/scholar?hl=en&as_sdt=0%2C5&q=cera+2022+chicken+manure&btnG=#d=gs_qabs&t=1768477231744&u=%23p%3Dvk5CZLCruKQJ)
9. Ling Liu, Jiwei Li, Guanghai Wu, Hongtao Shen, Guozhan Fu, Yanfang Wang(2021) PeerJ 9, e11754. [https://scholar.google.com/scholar?hl=en&as\\_sdt=0%2C5&q=ling+liu+2021+manure&btnG=#d=gs\\_qabs&t=1768355112165&u=%23p%3DOvMci3dd0g](https://scholar.google.com/scholar?hl=en&as_sdt=0%2C5&q=ling+liu+2021+manure&btnG=#d=gs_qabs&t=1768355112165&u=%23p%3DOvMci3dd0g)

10. Mandzhieva, Dmitry Rudoy, Evgeniya V Prazdnova, Vereshak Elena, Galina Zelenkova, Anuj Ranjan(2023) Environmental Geochemistry and Health 45 (12), 9303-9319.
11. Melanie D Ratilla, Alfredo B Escasinas(2020) 7th International Conference on Agriculture.  
[https://scholar.google.com/scholar?hl=en&as\\_sdt=0%2C5&q=applying+chick+en+manure+in+philippines&oq=applying+chicken+manure+in+philipp#d=gs\\_qabs&t=1768353238030&u=%23p%3D3XIX2MDYvbQJ](https://scholar.google.com/scholar?hl=en&as_sdt=0%2C5&q=applying+chick+en+manure+in+philippines&oq=applying+chicken+manure+in+philipp#d=gs_qabs&t=1768353238030&u=%23p%3D3XIX2MDYvbQJ)
12. Merhama M. Sammah, Sharnalyn K. Ammad, Munib J. Baki, Milda M. Aming, Fernalyn H. Kairan, Aldimar S Murphy(2025). International Journal of Multidisciplinary: Applied Business and Education Research.<https://ijmaberjournal.org/index.php/ijmaber/article/view/2655>
13. Mihoub, A., Naeem, A., Amin, A. E.-E. A. Z., Jamal, A., & Saeed, M. F. (2022). Communications in Soil Science and Plant Analysis, 53(19), 2596–  
<https://www.tandfonline.com/doi/abs/10.1080/00103624.2022.2072859>
14. Mirjana Brmež, Josipa Puškarić, Tamara Siber, Emilija Raspudić, Dinka Grubišić, Brigita Popović(2028) Poljoprivreda 24 (1), 3-9  
[https://scholar.google.com/scholar?hl=en&as\\_sdt=0%2C5&q=brmez+2018&oq=brmez+20#d=gs\\_qabs&t=1768476925472&u=%23p%3D6WmKJPPIxQMJ](https://scholar.google.com/scholar?hl=en&as_sdt=0%2C5&q=brmez+2018&oq=brmez+20#d=gs_qabs&t=1768476925472&u=%23p%3D6WmKJPPIxQMJ)
15. Moniz, A. C., & dos Santos, A. (2023). Effect of organic fertilizer of chicken manure and organic mulch on growth and yield of zucchini (Cucurbita pepo L.). International Journal of Agriculture and Nutrition, 5(1), 91–95.
16. Özlem Altuntaş, Rabia Küçük, Lale Ersoy(2022),The Effect of Chicken Manure on Plant Growth Nutrient Content and Yield of Lettuce. Biological and Chemical Research 9, 9-18
17. Quingqing Huang, Yanan Wan, Zhang Luo, Yuhui Qiao, Dechun Su, Huaafen Li(2020) Archives of Agronomy and Soil Science 66 (13), 1753-
18. Quishamar Dayo De Guzman, Anne Kristine Anitohin Flores, John Lloyd Jocoson, KLD Nograda, MS Serrano(2024) International Journal of Science and Research Archive 11 (2), 1372-1386,
19. Roger Y Ibañez Jr, Jacob Frederick P Velza, Cristito C Pelayo Jr(2023) Biosaintifika: Journal of Biology & Biology Education 15 (3), 289-295
20. RJ Alesa, Suzette B Lina(2022) Journal of Agriculture and Technology Management 25 (1), 102-10.
21. Tatiana Minkina, Svetlana Sushkova, Yanina Delegan, Anzhelika Bren, Maria Mazanko, Yulia Kocharovskaya, Andrey Filonov, Vishnu D Rajput, Saglara