The Different Treatments of Quail (*Coturnix coturnix*) based Manure Compost

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Abstract— *This study aimed to determine the efficacy of a 14-day rapid odor erasing microbial composting powder (OEMCP) on quality of the quail manure based compost as assessed pH, temperature, harvest recovery and germination index of pechay (Brassica rapa). The treatments were namely; T1-control (50 kg Quail Manure (QM) + 50 kg Fly Ash); T2 (50 kg QM + 50 kg Fly Ash + 350g OECMP; T3 (50 kg QM + 50 kg Fly Ash + 400g OECMP) and T4 (50 kg QM + 50 kg Fly Ash + 450g OECMP). The pH value was substantially reduced ($p<0.01$) in T3 and T4 compared to the T1, providing ideal environment for composting. Temperature significantly increased ($p <0.01$) in T2 and T3 compared to TI indicating more active fermentation activity. The highest harvest recovery was achieved in T2 of 51.67 against only 43.00 % in T1. Finally, T2 had a significantly higher germination index ($p<0.01$) of 71.33% compared to TI of only 29.33% demonstrating an improved nutrient packed composition of the compost. Therefore, the above findings demonstrated that the OEMCP was an effective composting additive for quail manure as confirmed by improved compost quality and increased germination index of pechay.*

Keywords— Environmental Challenges, Quail Manure, Rapid Composting Microbes, Organic Fertilizer.

I. INTRODUCTION

Agriculture has been performed for thousands of years without the use of synthetic chemicals. Chemical fertilizers have recently been used more frequently in soil management strategies to boost crop yields by enhancing nitrogen availability. The use of these agrochemicals not only degrades cultivable land but also leads to agricultural pollution. Sustainable organic fertilizer is the ideal solution to this problem because it uses only natural resources such as organic materials, plant and animal wastes, and microorganisms (Ahmad et al., 2007). Organic matter boosts the soil's cation exchange capacity. Aside from the ability to give nutrients, organic fertilizers can also alter the physical, chemical, and biological qualities of the soil, which can considerably increase plant growth and development (Gonzales et al., 2015).

The growing interest in organic farming has been increasing in recent years as mandated by the Philippine Organic Agriculture Act of RA 10068. The term "organic agriculture" (OA) refers to all agricultural practices that support the production of food and fibers in a way that is environmentally friendly, commercially viable, socially acceptable, and technically feasible. Instead of using chemical fertilizers, pesticides, and pharmaceuticals, it drastically reduces external inputs.

It is interesting to note that a potential bulking agent, which is a major raw material for organic fertilizer production, is abundantly available in Nueva Ecija. This is made possible due to the existence of two Rice Hull Fired Power Plants that can generate electricity. The by-product of burning rice hull is “Fly Ash” which is now becoming popularly known as a valuable and effective bulking agent of animal manure for the production of organic fertilizer.

Due to expanding population and environmental issues have arisen in quail production. The environmental impact of poultry production has received increasing attention over the last several decades. The production of poultry adversely affects the environment in several ways, including improper disposal of their manure. As a result, intensive poultry production is considered to be associated with greenhouse gas emissions, humidification, and eutrophication (Rodic et al., 2011). To solve

the waste problem, an environmentally friendly alternative such as the conversion of animal manure to organic fertilizer should be popularized.

Furthermore, to maximize the usefulness of quail manure properly, its major nutrient contents should be enhanced for the crop's needs, hence, it should be processed as an organic fertilizer material to supply the desired optimum nutrient requirement (Mendes et al., 2013).

1.1 Environmental Issues in Quail Production:

Poultry facilities release odors and attract flies, rodents, and other pests that cause nuisances and spread disease. Odor emissions from poultry farms, caused by a variety of contributing compounds such as ammonia (NH3), volatile organic compounds (VOCs), and hydrogen sulphide (H_2S), have a negative impact on the lives of those who live nearby (Maheshwari, 2013). Poultry production such as quail farming has created significant pollution worldwide and has been a long-standing issue. Poultry wastes are credited with causing this environmental problem. As the world's population continues to grow, as well as the production of animal products, along with the collection of waste organic matter, particularly quail manure. Keeping them causes a lot of issues improper waste disposal may cause, polluting soil, surface water, and groundwater, and releasing toxic gasses and odors are all examples (Atiyeh et al., 2000; Nunez-Delgado et al., 2002; El-Mashad, 2003). There is a major environmental impact created by the daily output of a large amount of quail farm droppings. This is one of the greatest consequences of illegal droppings storage areas, which pollute the soil, the water supply, and wildlife in general. Groundwater surrounding poultry farm areas contains pollutants that not only cause a sharp odor but also contribute to the development of emission of greenhouse gasses (Antonov et al., 2021).

1.2 Nutrient Content of Quail Manure:

Manure from poultry contains all 13 of the essential plant nutrients that plants are needed to survive and grow (Chastain et al., 2001). Manure from poultry, such as quail manure, is considered to be a superior organic fertilizer. Manure includes nitrogen, potassium, phosphorus, and other nutrients, which makes it an excellent source for improving soil productivity (Bandyopadhyay et al., 2009). Poultry dung, in particular, provides nitrogenous nutrients, which include both chicken and quail. Rizk et al. (2007) discovered increased nitrogen levels in quail dung, which provides an immediate and accessible source of nitrogen for plants.

1.3 Bulking Agents:

A bulking agent in composting has a very important role in controlling the problems associated with the moisture content in composting. Not only that, but bulking agents also determine how to control odor issues by maintaining the moisture in the composting process for a successful composting procedure (Gupta et al., 2013). Wood chips, sawdust, grass hay, rice husks, corn stalks, grass clippings, animal manure, fruit and vegetable waste, garden trimmings, deciduous leaves, and other bulking agents are used in composting. These bulking agents are used in the composting process based on the compost's needs, such as nutrient content, moisture, pH, and air supply to compost material. Different bulking agents are used in various composting processes such as food waste composting, vermicomposting, industrial waste composting, agricultural waste composting, and weed composting (Bernal et al., 2009). A study found that bulking agents such as rice husk, sawdust, and Fly Ash increased degradation and produced compost. There are plenty of macronutrients and micronutrients in Fly Ash that are readily available to plants and may improve the physical, chemical, and biological properties of soils. Fly Ash can enhance plant biomass production from degraded soils when combined with organic manure (Jala et al., 2006). Fly Ash can be considered an eco-friendly and economical fertilizer. It's good for soil health and crop performance, so has lots of potential for crop yield and Fly Ash contains high concentrations of K, Na, Zn, Ca, Mg, and Fe (Basu et al., 2009). Furthermore, the construction of a Rice hull gasifier plant (GIFTC) in Talavera Nueva Ecija, Philippines can produce electricity (12mw per hour) and Fly Ash (60 tons per day). Fly Ash is produced when a rice hull is burned in the gasifier plant.

1.4 Qualities of a Good Compost:

Composting is a sustainable method of disposing of manure. It undergoes aerobic, biological processes, with the help of natural microorganisms, and produces organic matter, which is degraded into a humus-like product or the organic fertilizer that is healthy, stable, and free of pathogenic microorganisms and weed seeds (Haug, 2018). The composting process involves chemical and physical changes: volume tends to decrease, due to the loss of water and the increase in dry matter. By decomposition of organic, the loss of organic carbon occurs in the form of CO2, and the content of ash increases. The C/N ratio becomes narrower, and the content of primary and secondary nutrients (P, K, Ca, Mg) increases (Tiquia & Tam, 2002;

Michel et al., 2004; Wang et al., 2004; Zhu, 2006). Varying manure types in terms of pH and conductivity values can influence plant growth.

Several factors, including substrate complexity and the number of enzymes involved, prevent cellulose degradation (Kim et al. 2005). Due to the wide variability in the many parameters involved in maintaining compost quality, this process necessarily requires a complex and comprehensive investigation.

Compost microorganisms thrive in neutral to acidic conditions with a pH between 5.5 and 8. Organic acids are formed during the early stages of degradation (Mao et al., 2017). The importance of determining the pH of compost depends on the plants it will be used on. Most plants thrive in soil with a neutral pH, and the pH changes in manure during the composting phase implied the occurrence of physical, chemical, or biological events during incubation. According to Kim et al. (2007), the temperature ranges of 57 to 71 degrees Celsius are frequently where thermophilic organisms actively decompose. The temperature of a composting process indicates the amount of activity that microorganisms are engaging in as they transform biodegradable organic matter into compost. It is one of the indicators used to determine how well the composting process works. Physical and chemical factors such as pH, temperature, and moisture content can all have an impact on bacterial communities and metabolism when composting. The relationship between these physiochemical characteristics may influence the compost's quality (Yang et al., 2020).

Seed vigor is the sum of seed germination and emergence rates, as well as production potential, and is an indicator of plant growth. In the field, seed quality and seed emergence are important indicators (Jia et al., 2020). High germination and vitality indexes are important characteristics of high-viability seeds. According to Kim et al (2005), to see how Synechocystis sp., KACC91007 affects the germination index of 1 Chinese cabbage when added to pig slurry or pig liquid fertilizer (PLF). The preliminary experiment included screening inoculant levels of 0.05, 0.1, 0.2, and 0.3%, respectively. The 0.05% inoculant concentration was chosen due to its low phytotoxicity and high Germination Index. The Germination Index value of untreated PLF under aerobic and anoxic processing conditions was 83 and 40.4%, respectively. When PLF was processed under anoxic and aerobic conditions, the germination index improved by more than 40 and 50%, respectively, with the addition of a 0.05% microbial inoculant. As a result of the addition of 0.05% microbial inoculant, the GI of Chinese cabbage increased, particularly under aerobic processing conditions.

1.5 Advances in Composting Technology:

Recent compost additive in the market contains 18 bacteria and 7 fungi. It is a biotech product that has been scientifically blended and contains nutritionally balanced food preparation microorganisms. It also contains balanced amounts of chelated trace minerals and micronutrients, enzymes, photo-vitamins, growth-promoting substances, amino acids, and organic acids, as well as functional compounds such as surfactants, emulsifiers, stabilizing agents, and antioxidants that are essential to enhancing and accelerating the production of organic fertilizer of the highest quality. It is also very effective at removing odors from all types of animal wastes, as well as reducing flies in poultry, pig, and livestock farms (ELR Family Trading Co., Inc. 2019).

1.6 Features of Rapid Composting Microbes:

Using rapid composting technology, substrates are inoculated with sterilized *Trichoderma harziamum*, a cellulose composer fungus (Cuevas, V.C. 1999). *T. harziamum* plays critical roles in biological decomposition and is also known as the producer of cellulose enzymes for nitrocellulose biomass bio-degradation and bio-control agents (Naher et al., 2014). Since the *Trichoderma* species has a well-known biological control mechanism, it has been widely used in agricultural applications based on the findings of global researchers, the evidence of the *Trichoderma* species has for dealing with plant diseases, plant growth, decomposition, and bio-remediation (Zin et al., 2020). Furthermore, the interaction between the plant and *Trichoderma* species successfully regulates root development, increasing the length of lateral and primary roots, and resulting in increased nutrient uptake efficiency by the plant (Zin et al., 2020).

In addition, According to Banayo et al., (2012), Bio-N is a "breakthrough technology" made up primarily of microorganisms that can convert nitrogen gas into an available form to reach the nitrogen requirements of host plants.

1.7 Quail Manure Benefits:

Quail manure similar to other poultry manure has an impact on the soil, and the plant's capacity to absorb nutrients. They both contain a wide range of nutrients, including nitrogen, phosphorus, and potassium. Hence, quail and poultry manure are useful in ensuring the bio-availability of their nutrients to plants (Pinheiro et al., 2014).

According to Gonzales, et al. (2015), the use of quail and poultry manure is very important for soil pH regulation, which ensures that phosphorus is available toplants. Quail manure consists of droppings, feathers, spilled feed, and bedding materials. One quail poultry farm typically has 10,000 on average population. Quail eats 30 grams of feed per day, and produces 18 grams of manure waste, with a daily output of 60% droppings (Antonov et al., 2021). It's high in organic matter and nutrient content, which promotes good soil texture, so it's great for agricultural soils where crops are grown (Schröder, 2005). Furthermore, quail manure should be preferred over other organic manures because it is rich in essential nutrients (Li et al., 2015). The use of Quail manure enhances pechay growth, development, yield, and quality (Aisha et al., 2007). Due to its lightweight and rich nutrients, it is extremely transportable (Li et al., 2011). By using it over time, nutrients will be held in the soil for a longer period, thus reducing the need for inorganic fertilizer.

1.8 Significance of Agricultural Waste Management:

In recent years, the management of agricultural waste has become increasingly significant due to the negative impact of inappropriate disposal. It has been proven that the process of agricultural waste recycling and recovery that turns waste into usable resources can reduce the quantity of waste and new resources utilized (Chang et al., 2019). To make good economic and environmental sense, managing agricultural waste is essential. Agricultural waste management strategies can help farmers understand how to recycle and reuse animal waste to make them more productive in their crops (Sudha et al., 2006). According to Ayilara et al. (2020), the importance of composting will result in a reduction in the use of chemical fertilizers in favor of compost. By reducing the number of toxic chemicals released into the environment, this shift will invariably benefit both the environment and human health. In its current state, much more education about the potential of this technology is required before it can be fully adopted by farmers. Regarding improvement technologies, some recommendations are made here to aid in their advancement. Furthermore, animal manure is an environmentally friendly way to enrich the soil with nutrients (Eghball et al., 2002). Aside from the ability to give nutrients, organic fertilizers can also alter the physical, chemical, and biological qualities of the soil, which can considerably increase plant growth and development.

II. METHODOLOGY

2.1 Quail Manure Collection:

The quail manure was collected from Lorenzo's Quail Farm Business at San Jose City, Nueva Ecija, Philippines in April 26, 2023. The 600 kg of quail manure was collected uniformly.

2.2 Odor Erasing Composting Microbial Premix:

The OEMC, which is the compost additive in this study, is composed of 25 beneficial and 50 amino and organic acids, chelated trace minerals, growth promoters, enzymes, and functional compounds.

2.3 Composting Plots Preparation:

Twelve plots measuring 1 ft x 4 ft x 4 ft representing 4 treatments replicated thrice and prepared. Temperature, pH, and moisture were taken from three sampling sites (the top, middle, and bottom of the piles). Replicates of samples from these treated plots were analyzed for temperature, pH, and moisture by a 4-in-1 soil survey instrument, while the odor, color, and texture were physically observed and recorded. The simultaneous recording of the above parameters was done at 6:00 AM; 2:00 PM and 10:00 PM from Day 1 to Day 7 and 6:00 AM; 6:00 PM from Day 8 to Day 14 especially for pH, temperature, and moisture. The same frequency and duration for determining the odor, texture, and color of the treated plots were done.

2.4 Treatment Plots Assignments:

TABLE 1
TREATMENT AND COMPOSITION OF COMPOST IN THIS STUDY

Treatments	Composition
T1 (Control)	50 kg QM + 50 kg Fly Ash
T2	50 kg QM + 50 kg Fly Ash + 350grams OECMP
T3	50 kg QM + 50 kg +Fly Ash +400 grams OECMP
T4	50 kg QM + 50 kg+ Fly Ash + 450 grams OECMP

2.5 Data Collected:

To address production performance and improvements, the following data was collected in order;

1) Odor, Color, and Smell – were physically observed and recorded
2) Temperature, pH, and Moisture – were measured by a portable soil test kit and will be taken from the sampling sites (top, middle, and bottom of the treated pile)
3) (%) Percent compost recovery – was calculated using the formula, original weight of the compost material - final weight divided by original weight of the compost material x 100
4) Germination Index, (%) - was calculated by counting the number of seeds germinated divided by the total number of seeds sown multiplied by 100%.

2.6 Germination Index:

The 100 pieces of pechay seeds were sown directly to seed germination trays, germinated seeds was counted when sprouts appeared and counting terminated after 7 days.

2.7 Statistical Analysis:

The data that was gathered in the study were analyzed using Analysis of Variance one-way ANOVA, Tukey HSD was used to determine whether there were significant differences in all treatment means.

III. Result and Discussion

3.1 Quick Manure Decomposition:

Treatment of livestock manure follows a variety of effective ways (Xiang et al., 2021). Aerobic composting is one of the best processes for handling agricultural waste because it controls odors, stabilizes microorganisms, and produces high-quality fertilizers.

I. Table 2
Mean physical parameter of Quail manure

Treatments	Texture	Color	Odor
1	Coarse	Black/Brown	Offensive
2	Coarse	Black	Slightly Offensive
3	Coarse	Black	Slightly Offensive
4	Coarse	Black	Slightly Offensive
5	Coarse	Black	Slightly Offensive
6	Coarse	Black	Slightly Offensive
7	Coarse	Black	Slightly Offensive
8	Coarse	Black	Odorless
9	Coarse	Black	Odorless
10	Coarse	Black	Odorless
11	Coarse	Black	Odorless
12	Slightly fine	Black	Odorless
13	Slightly fine	Black	Odorless
14	Slightly fine	Black	Odorless

Table 2 shows the mean physical characteristics of all the treated quail based manure compost with the addition of the 14 -day rapid composting microbes. lt showed that the compost is ready to be used on day 14. From day 1 to day 11, the texture was coarse. Then, from day 12 to 14, it was slightly fine, and the color became black. Further, the odor of the compost on day 1 was offensive, and on days 2 to 7 the odor was slightly offensive, and finally it was completely odorless on day 8.

3.2 Compost pH:

The pH is a measure of the acidity or basicity of compost. As pH contributes to the microbes' decomposition process, it is a crucial component of composting. Compost pH was observed for 14 days.

TABLE 3

MEAN PH OF QUAIL BASED MANURE COMPOST

Treatments	pH
T1 (Control)	5.24[b]
T2	5.61[a]
T3	5.35[b]
T4	5.27[b]
Mean	5.37
P-value	1.04E-05

Analysis of variance at .05% level of significance

****Means with different letters in the column are significantly different (p < 0.01).***

Table 3 showed the mean comparative pH for 14 days. T2 with a pH of 5.61 was significantly different (p <0.01) to T1 with 5.24. The result favors composting and is in agreement with the studies of (Mao et al. 2017) that compost microorganisms thrive in neutral to acidic conditions with a pH between 5.5 and 8 considering that organic acids are formed during the early stages of degradation. The importance of determining the pH of compost depends on the plants it will be used on. Most plants thrive in soil with a neutral pH. Moreover, the pH changes in manure during the composting is evident by the occurrence of physical, chemical, or biological events during incubation.

In the study of Kim et a., (2016), during the composting of animal manure, moisture content affects the physiological traits of microbes and the physical structure. Because of increased microbial activity, aerobic microorganisms consume more active oxygen during composting if the moisture content is kept at a proper level.

3.3 Compost Temperature:

Energy is released as organic matter decomposes, increasing heat. This heat creates a condition in which bacteria (good bacteria) can break down waste.

TABLE 4

MEAN PHYSICAL PARAMETER OF QUAIL MANURE IN TEMPERATURE C0

Treatments	Temperature C^0
T1 (Control)	30.89[b]
T2	43.72[a]
T3	36.53[ab]
T4	34.91[b]
Mean	36.51
P-value	1.95E-06

****Means with different letters in the column are significantly different (p < 0.01).***

Table 4 showed the highest average of 43.72 came from T2 (50 kg QM, Fly Ash, and 350g OECMP). T3 (50 kg Fly Ash, 400g OECMP, and 50 kg QM) had an average of 36.53, and T4 (50 kg QM, 50 kg Fly Ash, and 450g OECMP) got only 34.91. An average of 30.89 was obtained by the T1-control (50 kg QM and 50 kg Fly Ash).

In the study of Kim et al. (2007), the temperature ranges of 57 to 71 degrees Celsius frequently favors thermophilic organisms of their decomposing activity. The temperature of a composting process indicates the amount of activity that microorganisms are engaging in as they transform biodegradable organic matter into compost. It is one of the indicators used to determine how well the composting process works.

However, according to Ho et al. (2022), several variables, including temperature, pH, moisture, oxygen, particle size, and C/N ratio, affect how quickly organic matter degrades during the composting process. The ideal conditions for composting have

been described as a thermophilic phase temperature of 45 to 55 °C, a pH range of 5.0 to 7.0, and a moisture content of 50 to 60%.

3.4 Harvest Recovery:

Compost recovery is measured to distinguish the impact of compost activity with or without additives on the mass of the various compost treatments used in the study. A higher compost recovery rate indicates that most of the raw materials were composted.

TABLE 5

MEAN PHYSICAL PARAMETER OF HARVEST RECOVERY

Treatments	Harvest Recovery,%
T1 (Control)	43[b]
T2	51.67[a]
T3	47.33[ab]
T4	44.33[b]
Mean	46.53
P-value	0.010819

*****Means with different letters in the column are significantly different (p < 0.01).***

Table 5 showed that the highest harvest recovery can be seen in the T2 (50kg QM, 50kg Fly Ash and 350g OECMP) 51.67, T3 (50kg QM, 50kg Fly Ash and 400g OECMP) 47.33, T3 (50kg QM, 50kg Fly Ash and 450g OECMP) 44.33 which is significantly from the T1-control (50kg QM, and 50kg Fly Ash) as the lowest harvest recover of 43.

According to a study by Antonov et al. (2021), quail droppings, as compared to chicken droppings, have been considered to be high-quality fertilizers that are used to enrich soil composition and feed vegetable crops because they contain essential plant minerals and have a more filled composition. However, it's important to strictly follow the dosage instructions when adding quail droppings to the soil, especially fresh ones, and maintain that the uric acid in these fertilizers inhibits the growth of seedlings of both young and mature plants and can result in "burns" on the leaves and roots of vegetation.

Furthermore, composting is a sustainable method of disposing of manure. It undergoes aerobic, biological processes, with the help of natural microorganisms, and produces organic matter, which is degraded into a humus-like product or the organic fertilizer that is healthy, stable, and free of pathogenic microorganisms and weed seeds (Haug, 2018).

3.5 Germination Index:

The seed germination index (GI), which is a required index in many national standards, is a widely used indicator of compost maturity. However, the sensitivity of various species' seeds to the biological toxicity of compost varies noticeably. Hence, choosing the right seeds is essential for measuring compost maturity with GI.

TABLE 6

MEAN PHYSICAL PARAMETER OF GERMINATION INDEX

Treatments	Germination Index, %
T1 (Control)	29.33[d]
T2	71.33[a]
T3	60.67[b]
T4	49.67[c]
Mean	52.75
P-value	3.60E-06

*****Means with different letters in the column are significantly different (p < 0.01).***

Table 6 showed that the effectiveness of using compost quality harvested compost as a potting media of pechay seeds in terms of GI. The T2 (5O kg QM, 5O kg Fly Ash, and 350g OECMP) obtain the highest GI of 71.33. It is significantly different from the

T3 (5O kg QM, 5O kg Fly Ash, and 400g OECMP) 60.67, T4 (5O kg QM, 5O kg Fly Ash, and 450g OECMP) 49.67. T1-control contains (5O kg QM and 5O kg Fly Ash) which obtained the lowest germination index of 29.33.

Therefore, it is important to figure out the compost's maturity. The change in compost maturity can be described using physical, chemical, and biological methods (Komilis, 2015). To assess the phytotoxicity and maturity of compost using one of these methods, the seed germination index (GI) has been widely used (Luo et al., 2018)., Zucconi et al. (1981), proposed the GI, which includes the effect of phytotoxic substances on seedling germination rate and radicle elongation. The most recent Chinese agricultural industry standard, 'Technical Specifications for Composting of Livestock and Poultry Manure', published in 2019, requires mature compost to have a GI of 70%. The newly revised organic fertilizer standard (NY525-2021) in China requires a GI of 70%.

IV. SUMMARY

The environmental impact of poultry production has received increasing attention over the last several decades. Growers of quail manure are currently under intense pressure from a variety of sources to reduce the environmental impact of their operations and adopt welfare-friendly practices. The main objectives of the study were to (a) determine the odor, color, texture, temperature, pH, and moisture of the various compost treatments, (b) determine the harvest recovery of the various compost treatments, and (c) determine the germination index of pechay seeds from the various compost media. To accomplish the objectives that were set and conducted from April to May 2023 at Barangay Bagong Sikat Science City of Munoz, Nueva Ecija. The study includes 12 replicates and 4 treatments. Composting has been proposed as a simple, low-cost, and environmentally friendly technology for stabilizing animal manure. Fly Ash has sufficient utility as a bulking agent in composting organic wastes, it is expected to solve the problems of industrial waste disposal and compost additives are mixtures of fertilizer, bacteria, or fungi that are intended to accelerate the composting process. The quail manure was decomposed in just 14 days before being applied to the potting media trays. To assess the quality of compost, the Germination Index of pechay seeds was performed in just 7 days. The results show that the GI of T2 71.33 average consisting of (50 kg QM, 50 kg Fly Ash, and 350g OECMP) has a highly significant effect in terms of GI among the treatments.

V. CONCLUSION

The use of quail manure is carried out as part of a strategy to promote integrated agriculture. Organic quail manure fertilizer has a high nutrient content and is easy to decompose. The temperature of the compost with OEMCP inclusion rates of 350 grams, was significantly different from the control. The pH of the compost with OEMCP inclusion rates of 350 grams was significantly different from the control. The germination index of the compost with OEMCP values rates of 350 grams is significantly different from the control. The conclusions of this study demonstrated that the development of pechay was significantly aided by the use of organic fertilizer in potting media.

RECOMMENDATION

Based on the result of the study, the OEMCP treatment compost at 350 grams or T2 is recommended to improve compost quality and recovery and germination index of pechay.

II. CONFLICT OF INTEREST

The authors declare no conflict of interest.

III. REFERENCES

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