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Citrullus Lanatus (Watermelon): Biofertilizer for Eggplants

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ABSTRACTS

The potential of using the rinds of watermelon on eggplants as a source of biofertilizer in the perspective of this study, the development of an alternative approach to the establishment of three treatments to determine which one is the most effective in terms of the growth of the eggplant, the number of leaves, and the yields. The eggplants treated with treatment 2 grew taller than the eggplants treated with the other treatments in terms of growth. While the eggplants treated with treatment 2 produced more leaves than the eggplants treated with the treatment 1 and 3 formulas, the eggplants treated with treatment 3 produced fewer leaves. Finally, we determined that, when compared to the other treatments, the eggplant treated with treatment 2 yielded eggplants in just 10 weeks. It yielded a total of three eggplants, whereas treatments 3 and 1 yielded no eggplants. This study successfully produced a biofertilizer that improves crops in obtaining the nutrients they require to grow. The eggplant experiments yielded excellent results and were found to have a significant effect on their growth and production. This was achieved through fermentation, which involved recycling the inedible wastes and peelings of "Citrullus Lanatus," also known as watermelon.

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1. INTRODUCTION

Fertilizers are chemical ingredients found in natural or man-made substances that help enhance the growth of every plant and produce more. The main goal of fertilizer is to make plants grow faster and healthier by supplying the elements that the plants need in readily available forms. There are two major classifications of fertilizers, organic and synthetic. Excessive use of synthetic fertilizer can "burn" foliage and can even harm your plants. Bioorganic Fertilizer (BOF) is a processed inoculated compost from any organic material that has undergone rapid decomposition by the introduction of homogeneous microbial inoculants (Zhang *et al*., 2020; El-Ramady *et al*., 2020).

There are various uses of biofertilizers that prove their importance (Agarwal *et al*., 2018). They include – improving the soil quality and yield of plants, protecting the plants from pathogens, avoiding environmental pollution, and destruction of harmful substances that are present in the soil, thus, are known to be eco-friendly and cost-effective (Bashan & De-Bashan, 2005).

In this study, the researchers will attempt to determine the effectiveness of using watermelon as a natural fertilizer to commercial fertilizers on the growth of vegetables in home gardens. Watermelon also adds several inches of aged compost or other rich organic matter to native soil, boosting plant growth. Adding a soaker hose or drip watering system will help develop huge, luscious watermelons.

2. METHODS

The study used an experimental method, namely the one-group design. The use of this approach is particularly suited given the study's objective, which is to determine the potential of using Citrullus Lanatus (watermelon) as a biofertilizer for eggplants in the home garden. This is a design involving one treatment with two or more levels. Which is a univariate analysis because there is only one variable, but with two or more levels (Cornell *et al*., 2009).

2.1. Procedure/preparation of treatment

We prepared three different sets of treatments: (i) T1: 500 grams of watermelon peeling mixed with 500 ml of water; (ii) T2: 300 grams of watermelon peeling mixed with 500 ml of water; (iii) T3: 100 grams of watermelon peeling mixed with 500 ml of water.

In each of the three treatments, there were at least two weeks to let the fermentation work. Prepared four large pots, filled them with good soil, and planted eggplant seeds in each one. We marked each pot with the letters T1, T2, T3, and C, which stood for "control," and then waited two weeks for the plants to grow.

2.2. Application of treatment

T_1, T_2, T_3, and C for control water sprays were made in four sets and labeled as follows: T_1, T_2, T_3, and C. Fill each label treatment with 4 mL of the fermented bottle and spray it into the labeled pots as directed each morning for two weeks.

2.3. Recording of the gathered data

The data that had been gathered from the three different treatments and controlled was validated, counted, and recorded into the table between weeks 6 and 10.

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3. RESULTS AND DISCUSSION

3.1. Effectiveness of the treatments used as biofertilizer for eggplants

Table 1-3 shows the results and summary of each treatment used as a biofertilizer, based on the summary of the growth of the eggplant, the number of leaves on the eggplant, and the number of yields of the eggplants.

Table 1 shows that eggplants given treatment 2, grew taller than eggplants given other treatments. When compared to Control C, which is the baseline eggplant with no treatment, the difference was 6.3 cm. Furthermore, it was discovered that treatment 3 and treatment 1 were 5.3 cm and 3.3 cm taller, respectively. This means that employing the right amount of organic formula and watermelon peelings as a biofertilizer can have a big impact on eggplant growth.

Table 1. Summary of the growth of eggplant using three different treatments.

Week	Treatment 1	Treatment 2	Treatment 3	Control C
6	5 cm	6.00 cm	3 cm	2 cm
8	5 cm	9.0 cm	3 cm	2 cm
10	5 cm	10.0 cm	3 cm	2 cm
Eggplant's Average Length of Growth	5 cm	8.3 cm	3 cm	2 cm

As shown in **Table 2**, the eggplants treated with treatment 2 generated more leaves than the eggplants treated with the treatment 1 and 3 formula. The number of eggplant leaves increased by over 91% with no treatment. The results show that by utilizing the proper formula of organic biofertilizer with watermelon peelings, the eggplant may generate more leaves.

Table 2. A summary of the number of leaves on the eggplant using three different treatments.

Week	Treatment 1	Treatment 2	Treatment 3	C (Control)
6	2	39.0	4	2
8	2	43.0	4	2
10	2	46.0	5	2
The average number of leaves in each treatment	2	42.6	5	20

Table 3 shows that the eggplant fertilized with treatment 2 produced eggplants in just 10 weeks, compared to the plants fertilized with other treatments. It produced a total of three eggplants, whereas treatment 3 and treatment 1 produced no eggplants. This suggests that the biofertilizer formula made with watermelon peelings in the correct proportion solution can grow eggplant faster in each short period, but the baseline eggplant (Control C) and other treatments yielded eggplant over a longer period.

Table 3. A summary of yield of eggplants using three treatments.

Week	Treatment 1	Treatment 2	Treatment 3	C (Control)
6	0	2	0	0
8	0	3	0	0
10	0	3	0	0
The total yield of eggplant	0	3	0	0

In conclusion, T2 was found to be the most effective of the three treatments used in the experiments, yielding 2.6 more eggplants than a standard eggplant grown without fertilizer.

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The T2 biofertilizer treatment was shown to have the most significant result of the three treatments. When compared to the other two treatments tested on the eggplant, it has the greatest growth potential. Treatment 2 also had the greatest effect on the eggplant leaves, resulting in a total of 42.6 leaves growing in 10 weeks after the treatment was applied to the eggplant. Treatment 2 will be used for other varieties of vegetables and other plants in future studies to ensure that the results are successful. To establish the cost-efficiency, a comparison study of treatment 2 vs any commercial fertilizer must be done.

4. CONCLUSION

It has been determined that, among the three other treatments, treatment 2 provides the best length of growth and quantity of leaves when applied daily. Furthermore, Treatment 2 was also shown to be the most effective treatment out of the three different treatments that were used in the experiment. It resulted in the growth of 2.6 more eggplants than an average eggplant that had been grown without the usage of fertilizer. It has been proven that, out of the three treatments, the biofertilizer treatment used in Treatment 2 has the most significant result. When compared to the other two treatments that were tried on the plant, it has the greatest potential for promoting the growth of the eggplant. Additionally, Treatment 2 had the greatest impact on the leaves of the eggplant, leading to a total of 42.6 leaves sprouting in the eggplant 10 weeks after the treatment was applied to it. This finding was the most significant difference between the treatments. Based on the conclusions, the researchers recommend the following courses of action are suggested: (i) Application of Treatment 2 to the different varieties of vegetables and other plants to verify the effectiveness of its results; and (ii) A comparative study on the effect of treatment 2 versus any commercial fertilizer must be conducted to determine the cost-efficiency.

5. AUTHORS' NOTE

The authors declare that there is no conflict of interest regarding the publication of this article. Authors confirmed that the paper was free of plagiarism.

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