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Efficacy of bio input products as organic foliar orchids Fertilizer

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Abstract

This study was conducted to determine the efficacy of different bio input products as organic foliar fertilizer on the growth and floral production of dendrobium and to recommend the best organic foliar fertilizer for orchid.

The results of the study showed that dendrobium orchid was highly responsive to the different bio organic foliar fertilizer. Dendrobium fertilized with Fermented Plant Juice (FPJ) was significantly the earliest to form active roots, longer root length, greatest increased in pseudobulb, earlier to initiate flower, more florets in every lead, bigger florets diameter, and higher flowering percentage compared to those treated with other bio - organic foliar fertilizer.

The use of fermented plant juice (FPJ) in 2:1 ratio (2 tablespoon : 1 liter of water) is recommended as best bio organic foliar fertilizer while fermented fish extract and Vermi tea is recommended as growth enhancer and rooting hormones for phalaenopsis orchids like dendrobium.

Keywords: Bio-organic, fermented plant juice, vermin tea, fermented fish extract, pseudobulb, dendrobium

1. Introduction

The floriculture industry are now flourishing due to its increasing demand for ornamental crops brought by the increasing population and the rising number of institutional buyers like hotels, restaurants, banks, parks establishment, residential, and various land development. Varieties of orchids are already successfully grown in our locality but a very limited scale on dendrobium may be due to its epiphytic growth habit, grows well on trees and rocks as well as lack of technical skills on cultural management practices like foliar fertilization.

Orchid fertilization is fundamental for a satisfactory plant growth and development for commercial orchid production as well as in collections. However, the floral production was highly affected with the oil crisis of 2008 that created big stir in the agriculture sector mainly due to the insurmountable rising cost of inorganic fertilizers is inevitably uncontrollable in the coming production years. In a world of many choices organic agriculture is a serious option for many farmers, enterprises and consumers. Looking into this perspective the farmers has to look for an alternative measures to sustain his farming business profitability.

Bio organic inputs products is one of the prime input in organic farming not only enhances the crop growth and yield but also improves the soil amendments and sustain soil fertility.

The focal of this study was to assess the efficacy of different bio input products as a foliar fertilizer for orchid.

Specifically, To determine the efficacy of fermented plant juice (FPJ, fermented fruit juice (FFJ), vermin tea, and fermented fish extract as organic foliar fertilizer on the growth and floral production of dendrobium, and to recommend the best organic foliar fertilizer for phalaenopsis species of orchid.

2. Materials and Methods

This study was laid out in completely randomized design (CRD) with 5 treatments and 3 replications. The different treatments were as follows:

T1 – Fermented Plant Juice (FPJ)

T2 – Fermented Fruit Juice (FFJ)

T3 – Vermin Tea

T4 – Fermented Fish Amino (FAA)

2.1. Construction of Orchidarium

A 4 x 3 square meter low cost protective shield Orchidarium made of bamboo and good lumber covered with UV treated film and fish nets was constructed to protect the experimental plant from too much rain and excessive sunlight.

2.2. Preparation of Different Treatments

A total of One hundred fifty (150) dendrobium as experimental plants with ten (10) test plants per treatments were tested. Preparation protocol of different treatments were followed from the procedure of Farmers buds on Bio-Organic Inputs for Plants, Fish and Animal liquid, extract (<http://ati.da.com>).

2.3. Preparation of Fermented Plant Juice (FPJ)

Freshly cut banana trunk was collected before sunrise (when plant's energy is at its peak and microorganism is available) and finely chopped, two (2) kg of chopped plant materials was thoroughly mixed to 1 kg of crude molasses in a large basin. The mixture was placed in a clay plastic container with 25% air space and covered with manila paper tied with a string, and was kept in cool and shaded places. After 7 days of fermentation, the liquid extracts were harvested by straining and was stored in plastic bottles.

2.4. Preparation of Fermented Fruit Juice (FFJ)

Ripe banana, molasses and tap water was mixed at the ratio of 1:1:1. This was placed in a clay pot with 25% air space and covered with manila paper tied with a string and kept for 7 days in cool place before the liquid extract was harvested through straining.

2.5. Preparation of Fish amino acids (FAA)

Chopped fish trashes (gills and entrails), molasses and tap water were mixed properly at the ratio of 1:1:1. The mixed materials were placed in a pail covered with manila paper with 25% air space and left for 14 days undisturbed in cool

place. After 14 days, the liquid extracts were harvested by straining and stored in dark bottles.

2.6. Vermin Tea

Readily available vermin tea was purchased from local vermin producer.

2.7. Purchased of dendrobium as test plants.

Dendrobium mother plants were purchased in Manila Seedling Bank to ensure uniform maturity.

2.8. Application of Organic Foliar Fertilizer

The application was based on the recommended dilution of 2 tablespoon of Fermented Plant Juice (FPJ), Vermin Tea, Fermented Fruit Juice (FFJ), Fish Amino Acid (FAA) in 1 liter of water respectively. Application was done early in the morning daily (Farmers Guide on Bio-Organic Inputs from Plants, Fish and Animal Liquid Extract) <http://ati.da.com>

2.9. Care of Orchids

Watering, pest and disease control and other cultural management operational were done throughout the experimental period.

3. Result and Discussion

3.1 Average Number of Days from Spraying to Active Roots Formation

Analysis of variance revealed that Fermented Plant Juice (FPJ) significantly the earliest to formed an active root after 14 days from fertilization but did not differ significantly to those fertilized with Fish Amino Acids (FAA) and Vermin Tea. This was attributed to the more nitrogen, phosphorus and potassium and other micro and macro element in Fermented Plant Juice (FPJ) and Fish amino acids (FAA) compared to the rest of other organic foliar fertilizer (Maghirang 2011) ^[5].

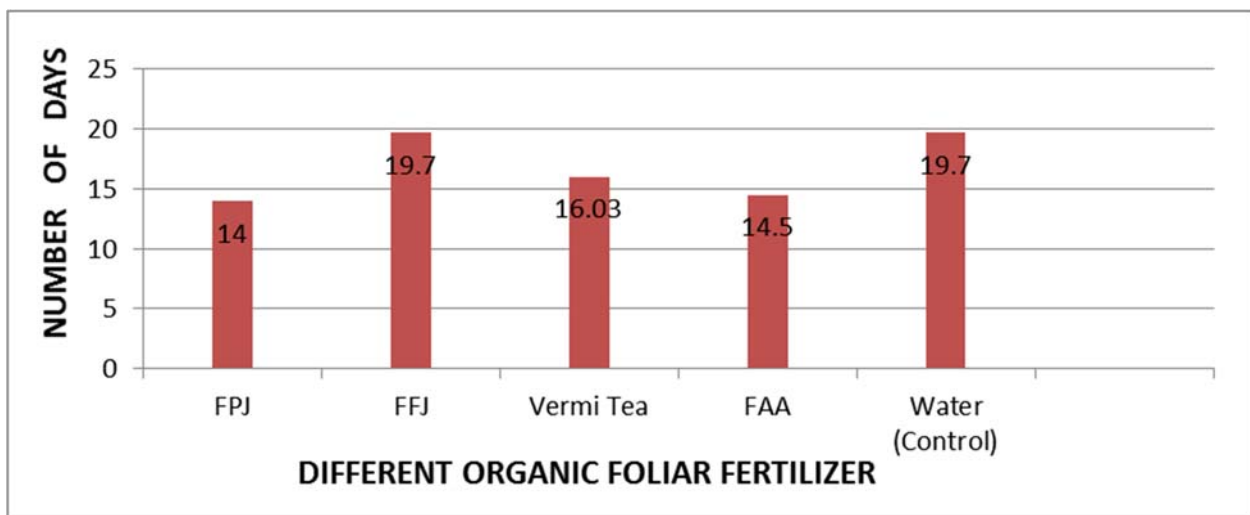


Fig 1: The average number of days from spraying to active roots formation of dendrobium as influenced by different bio organic foliar fertilizer

3.2. Average Root Length (cm)

Results revealed that the growth of roots was statistically affected by the different bio organic foliar fertilizer. Dendrobium fertilized with Fermented Plant Juices (FPJ) significantly obtained the longest roots of 10.32 cm but

statistically comparable to vermin tea and fish amino acid. While, those fertilized with Fermented fruit Juice and water as control produced the shortest roots with 1.89 cm, and 4.1 cm respectively (Figure 2).

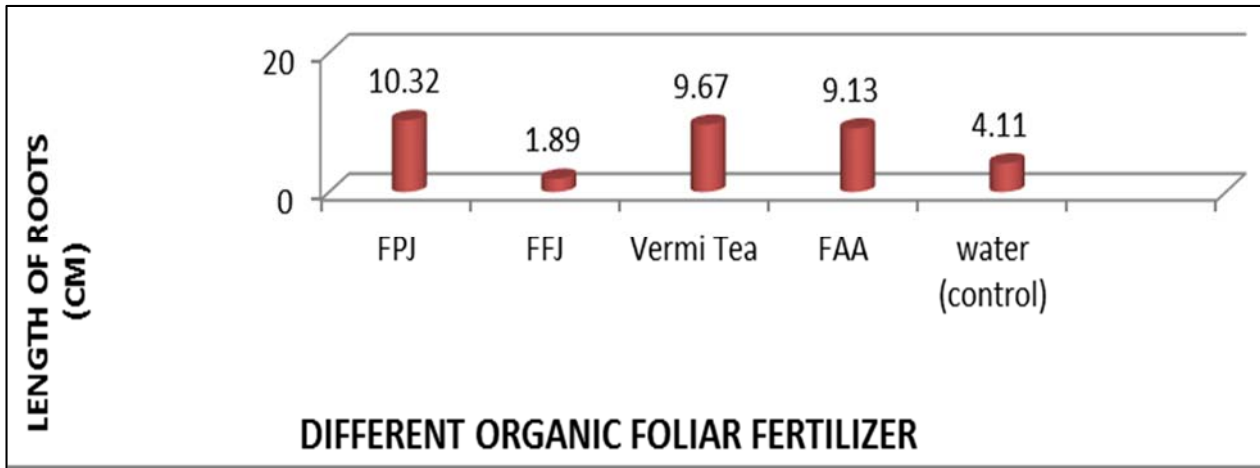


Fig 2: The average root length of dendrobium as influenced by different bio organic foliar fertilizer

3.3 Average increased length of Pseudo Bulb (cm): Result showed that dendrobium sprayed with fermented plant juice

significantly exhibited the greatest increased in pseudo bulb compared to the rest of the treatment (Figure 3).

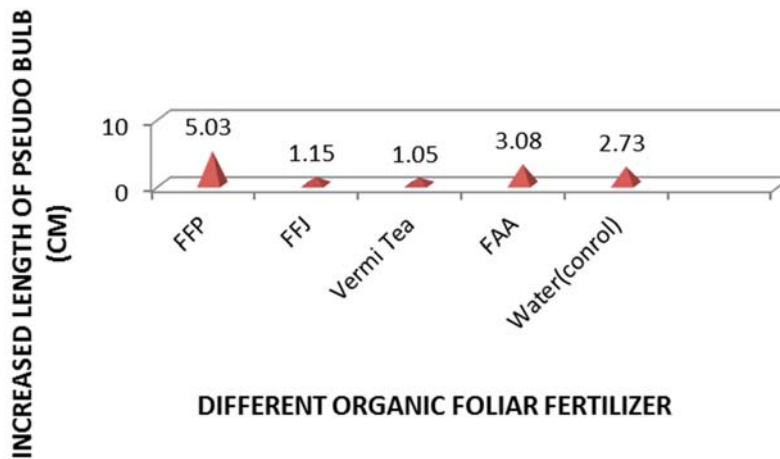


Fig 3: The average increased length of pseudo bulb of dendrobium as influenced by different bio organic foliar fertilizer

3.4 Average Number of Days from Spraying to Flower Initiation

Analysis of variance revealed that Fermented Plant Juice (FPJ) significantly the earliest to initiate floral formation after 26.67 days from fertilization compared to the rest of the treatment. While, the control was observed late to initiate flower. This was attributed to the more nitrogen, phosphorus and potassium and other micro and macro element in Fermented Plant Juice (FPJ) and Fish amino acids (FAA)

compared to the rest of other organic foliar fertilizer (Maghirang 2011)^[5]. On the other hand, the average number of florets in every lead was significantly influenced by the application of different bio organic foliar fertilizer. Dendrobium specie sprayed with Fermented Plant Juice (FPJ), Fermented Fruit Juice and Vermi Tea and Fish amino acid (FAA) significantly produced more florets compared to control.

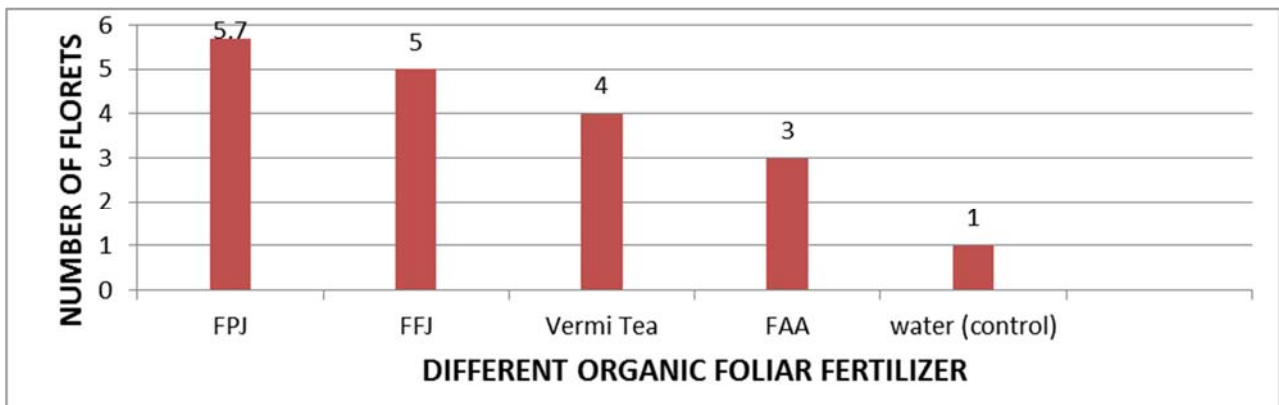


Fig 4: The average number of floret in every lead of dendrobium as influenced by different bio organic foliar fertilizer

3.6 Average Florets Diameter (cm)

Statistical analysis revealed no significant difference on average florets diameter of dendrobium (Appendix Table 6a). However, dendrobium fertilized with Fermented Plant

Juiced (FPJ) obtained numerically the biggest florets diameter (7.02) cm followed by Vermin Tea (5.20) cm and Fish amino acid (4.82) cm, while control got the narrow diameter of 2.03 cm only (Figure 5).



3.7 Flowering Percentage

Result appeared that Dendrobium fertilized with Fermented Plat Juice (FPJ) significantly obtained higher percentage of flowering 57.37% compared to the rest of the organic foliar fertilizer. Control (water) obtained lower flowering

percentage. These results conformed to the study conducted by Paglaunan *et al.* 2010 that eggplant treated with fermented plant juices produced the greatest number and heaviest weight of marketable fruits due to more potassium content in FPJ as cited by Maghirang 2011.

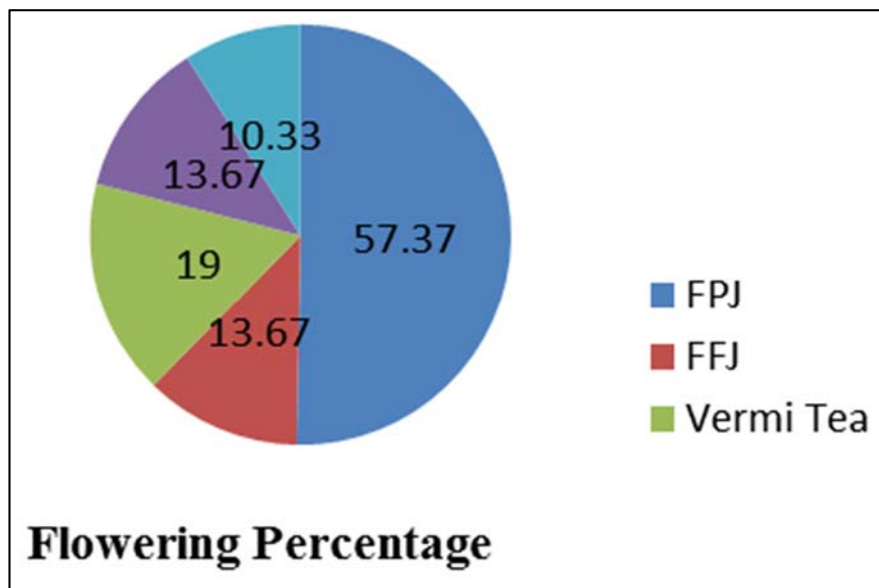


Fig 6: The flowering percentage of dendrobium as influenced by different bio organic foliar fertilizer

4. Summary

This study was conducted to assess the efficacy of different bio organic foliar fertilizer on the growth and floral production of dendrobium species of orchids; and to recommend the best organic fertilizers for phaleanopsis orchids family.

The experiment was laid out in Completely Randomized Design (CRD) with 5 treatments and 3 replication. The different bio organic foliar fertilizers were: T₁ (Fermented

Plant Juice), T₂ (Fermented Fruit Juice), T₃ (Vermi Tea), T₄ (Fermented Fish Extract) and T₅ (Water as Control)

The result of the study showed that Dendrobium fertilized with Fermented Plant Juice (FPJ) significantly the earliest to form active roots, initiate flower, longer root length, greatest increased in pseudobulb length, more florets in every lead, and higher flowering percentage compared to those treated with other organic foliar fertilizer.

Table 1. Growth and Floral Yield of Dendrobium Fertilized with Different Bio Inputs Products as Organic Foliar Fertilizer

Treatment	Days from spraying to active roots formation	Root Length (cm)	Pseudo Bulb Increased (cm)	Days to Flower Initiation	Number of florets in every lead	Average Florets Diameter (cm)	Flowering Percentage
FPJ	14.0 ^a	10.32 ^a	5.03 ^a	26.67 ^d	5.7 ^a	7.02	57.37 ^a
FFJ	19.7 ^b	1.89 ^c	1.15 ^c	41.00 ^b	5.0 ^{ab}	4.39	13.67 ^b
VT	16.0 ^a	9.67 ^a	1.05 ^c	33.50 ^c	4.0 ^{ab}	5.20	19.00 ^b
FAA	14.5 ^a	9.13 ^a	3.08 ^b	41.50 ^b	3.0 ^{ab}	4.82	13.67 ^b
Water	19.7 ^b	4.11 ^b	2.73 ^b	50.00 ^a	1.0 ^b	2.03	10.33 ^b

5. Conclusion

The following conclusions were made based on the result of the study:

Different bio organic foliar fertilizer significantly influenced the growth and floral production of orchids. Dendrobium fertilized with fermented plant juice yielded the excellent formation of active roots, initiate flower, greatest increased in pseudo bulb, longest root length, more florets per lead with higher flowering percentage.

Fermented Plant Juice (FPJ) was proven the best bio organic foliar fertilizer for phaleanopsis orchids like dendrobium.

6. Recommendation

The use fermented plant juice (FPJ) in 2:1 ratio (2 tablespoon: 1 liter of water) is recommended as best bio organic foliar fertilizer while fish amino acids (FAA) and Vermi tea is recommended as growth enhancer and rooting hormones for phaleanopsis.

7. Acknowledgement

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