

Enhancing Environmental Management through a Luxuriant Vegetative Improvement of *Ixora Coccinea* L. By Means Of Organic Manuring

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Abstract

Ixora flowers are strong hardy flowers of very great economic importance; they are ornamental plants that are grown for decorative purposes in gardens and landscape design, projects, as house plants, for cut flowers and specimen display. It can be propagated through stem cuttings, layering, grafting and seeds. The experiment was carried out using 16 potted plants of *Ixora coccinea* raised in bowls arranged in 4 treatments with 4 replicates. This study was designed to evaluate the effect of organic manures on *Ixora coccinea* as an ornamental plant. The rate of application of each organic manure was 5 tons per hectare. The organic manures used were, Sunshine; Tithonia and Cassava peel compost. They were so selected because of their abundance and are easy to prepare by florists. Reading obtained from parameters taken was analyzed using analysis of variance (ANOVA). The use of organic manure had a visible effect on the physical appearance of *Ixora* though data analysis did not show any significant difference. Considering the physical appearance and the luxuriant look of *Ixora coccinea* on the field, cassava peel compost in the treatment of *Ixora coccinea* plant is preferred to other treatments.

Keywords: *Ixora*– flowers, Organic-manure, Multi-branch, Aesthetic, and Whorled.

Introduction

Ixora flowers are strong hardy flowers of very great economic importance through aesthetic beautification of the environment but of difficult propagation. Planting of *Ixora* flowers might not be as easy as other ornamental plants due to its high rate of evapotranspiration which makes it require more irrigation, moisture, slightly acidic soil, humid atmospheric condition. The evapotranspiration (the coinage of evaporation and transpiration) of *Ixora* flower that is high, makes it more difficult to propagate and it makes it advisable to be planted and raised under controlled atmospheric condition and should be well supervised (Rahuj, 1999).

Ixora is said to derive its name from “Iswara” which is a title of Malabar deity to whom flowers are offered to (Rahuj, 1999) or probably from the Sanskrit word Iswara which simply means god. *Ixora*, which is also known as jungle flame, flame of the world, jungle geranium of scarlet

jungle, spread to India where it is used in Hindu temple for making garland which turns out to be a must for all worshipers especially for the goddess of 'Durga'.

The genus *Ixora* consists of about 400 species varying in leaf size, flower color, adaptability and so on. *I. chinensis*, *I. florida*, *I. degmensis*, *I. speciosa* are examples of species under *Ixora* but the commonest of the *Ixora* specie is the *Ixora coccinea* which was used as a case study in this experiment. *Ixora coccinea* is popular because of its hardness and its color separation and its adaptability rate compared to other species (Adetimirin, 2008). *Ixora coccinea* can be identified by its red flower while species produce flowers like yellow, gold, white, orange and even pink.



Figure 1. Picture of a typical stand of *Ixora coccinea*(L)

Materials and Method

Soil Collection and arrangement of materials used

The soil used was collected from under Gmelina vegetation. The soil is a surface soil (0 – 15cm), but dark in color indicating the presence of humus. As at the time of collection, the land was lying fallow.

The soil was crushed and sieved to increase the surface area and remove the debris in the soil. The soil was then weighed (5kg) into a plastic pot and then moistened. The *Ixora coccinea* used for planting was obtained from a parent plant at a teaching and research farm in south western, Nigeria. The soil, after measurement was poured in a perforated bowl of 7kg capacity and watered. It was allowed to drain and spaced at 1m x 1m spacing in between treatment rows. One twig of *Ixora coccinea* was planted in each bowl. A total of 16 bowls were arranged in 4 treatments with 4 replicates and watering was done.

Weeding was done on each bowl manually by handpicking.

Research Design

The research is a randomized complete block design (RCBD) and there were four treatments and four replicates.

Treatments used were:

T₀ – Control

T₁ – Sunshine organic

T₂ – Tithonia manure

T₃ – Cassava peel compost

Manure application

The rate of application of manure followed the recommendation of Jama *et. al.* (2000) that 5 tons dry matter ha⁻¹ can be effective source of N.P.K. for leafy crops in general terms.

Data Collection

Number of leaves after survival, number of survival plants, length of internodes, height of plant over time and the number of branches after survival.

Parameters Studied

Numbers of Leaves after Survival

This would be achieved by counting of leaves on each stand of *Ixora coccinea* and all leaves starting from the base to the last prominent leaf on the tip were included.

Number of Branches after Survival

This was done by counting the number of branches per Ixora flower stand and the readings taken down.

Length of Internodes

Here, a transparent meter rule was used in measuring the distance between one branch and the preceding one on the same plant and then recorded.

Height of Plant Overtime

This was done by placing the transparent meter rule beside the plant stand to measure it. The reading started from the base of the plant (soil level) and stretched to the tip of the plant.

Number of Survival Plant

This was achieved by counting the total number of plants that sprouted after transplanting.

Data Analysis

The data collected was subjected to analysis of variance (ANOVA) and the least significant difference was calculated along the treatment.

Experimental Layout

T ₀	T ₁	T ₂	T ₃
T ₁	T ₂	T ₃	T ₀
T ₂	T ₃	T ₀	T ₁
T ₃	T ₀	T ₁	T ₂

Result And Discussion

This section of the research highlights the result in graphical form.

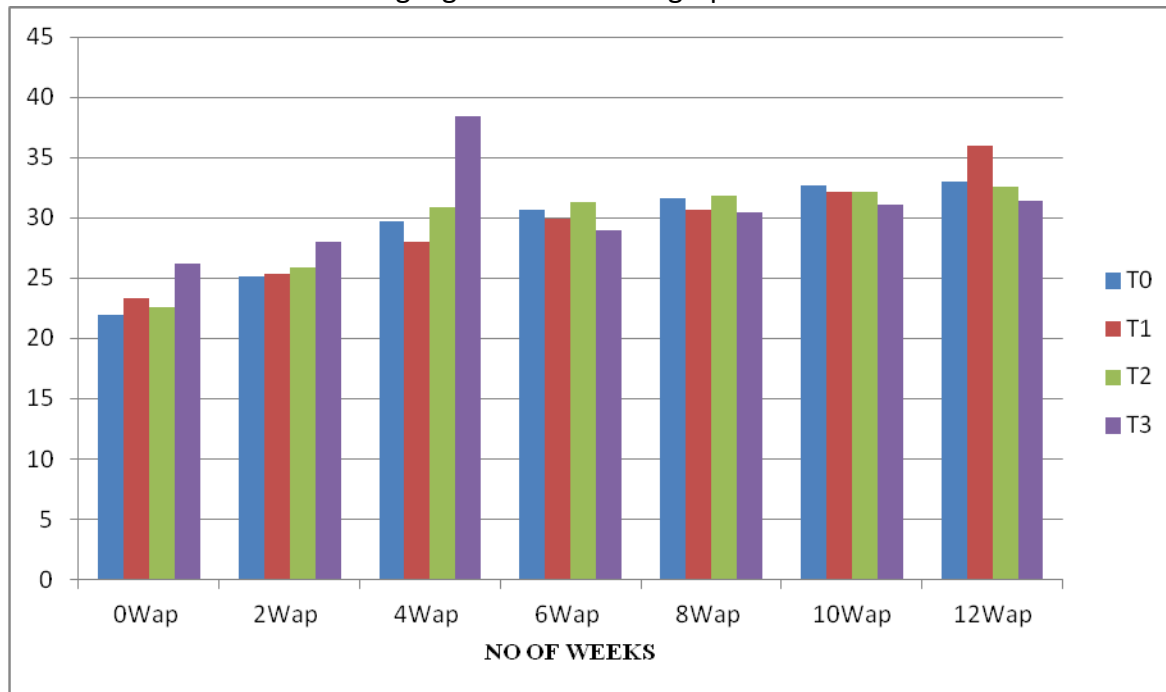


Figure 2: EFFECT OF ORGANIC MANURES ON PLANT HEIGHT (WAP= Week after Planting)

For plant height at 0Wap, T₀ had the shortest height while T₃ had the tallest, at 2Wap. T₀ had the shortest while T₃ had the tallest height, at 4Wap, T₁ had the shortest height while T₃ had the tallest, at 6Wap T₃ had the shortest while T₂ had the tallest height, at 8Wap T₃ had the shortest height while T₂ had the tallest height while at 10Wap T₃ had the shortest height and T₀ had the tallest and finally at 12Wap T₃ had the shortest height while T₁ had the tallest height. The least significant different (LSD) procedure shows that there is no significant difference among treatments.

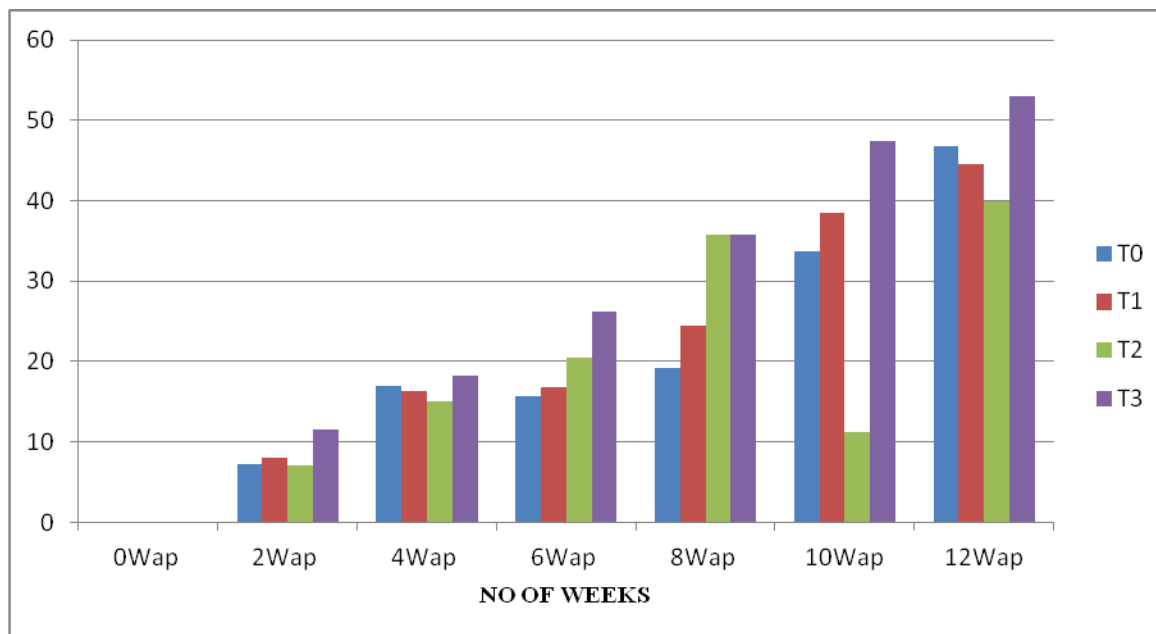


Figure 3: EFFECT OF ORGANIC MANURES ON NUMBER OF LEAVES(WAP= Week after Planting)

There are no leaves at 0wap, at 2wap, T₂ had the least number of leaves while T₃ had the highest number of leaves, at 4wap, T₂ had the least number of leaves while T₃ had the highest, at 6wap T₀ had the least number of leaves which T₃ had the highest number of leaves, at 8wap T₀ had the least number of leaves while T₂ and T₃ had the highest number of leaves while at 10wap T₂ had the least number of leaves while T₁ had the highest and finally at 12wap T₂ had the least number of leaves while T₃ had the highest number of leaves. The least significant different (LSD) procedure shows that there was no significant difference among treatments.

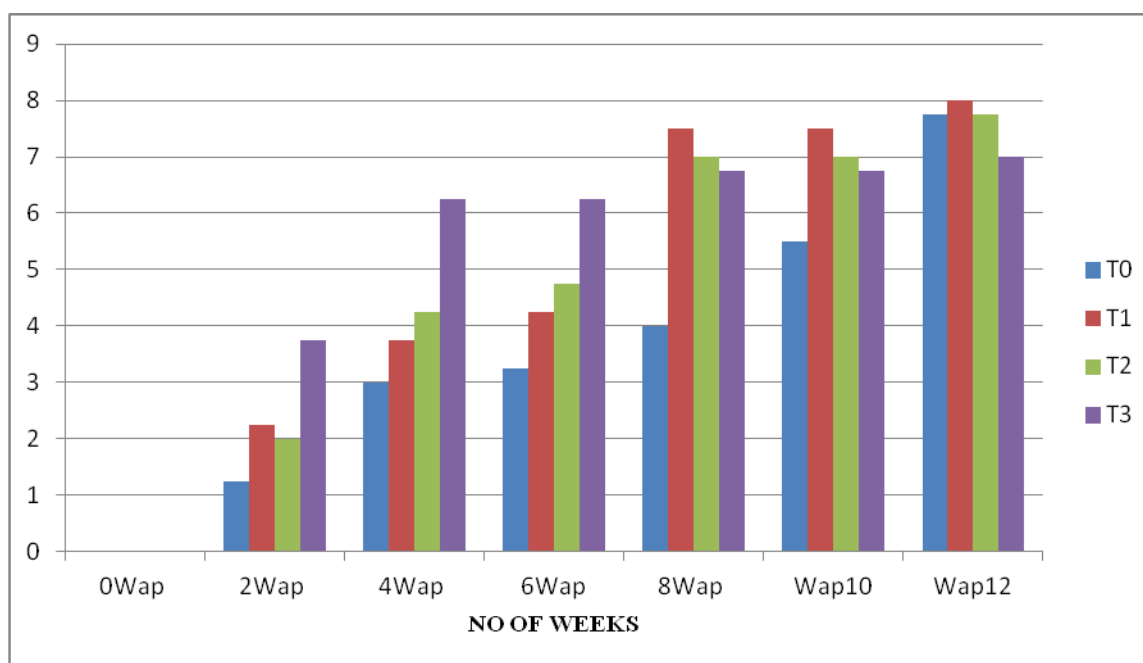


Figure 4: EFFECT OF ORGANIC MANURE ON NUMBER OF BRANCHES

The branches started emerging at 2wap, at 2wap T₀ had the least number of branches while T₃ had the highest number of branches, at 4wap T₀ had the least number of planting while T₃ had the highest, at 6wap T₀ had the least number of planting while T₃ had the highest number of planting, at 8wap, T₀ had the least number of branches while T₁ had the highest while at 10wap, T₀ had the least number of branches while T₁ had the highest and at 12wap, T₃ had the least number of planting while T₀ and T₂ had the same number of branches and T₁ had the highest number of branches. Although the least significant different (LSD) procedure shows that treatments were not significantly different from one another.

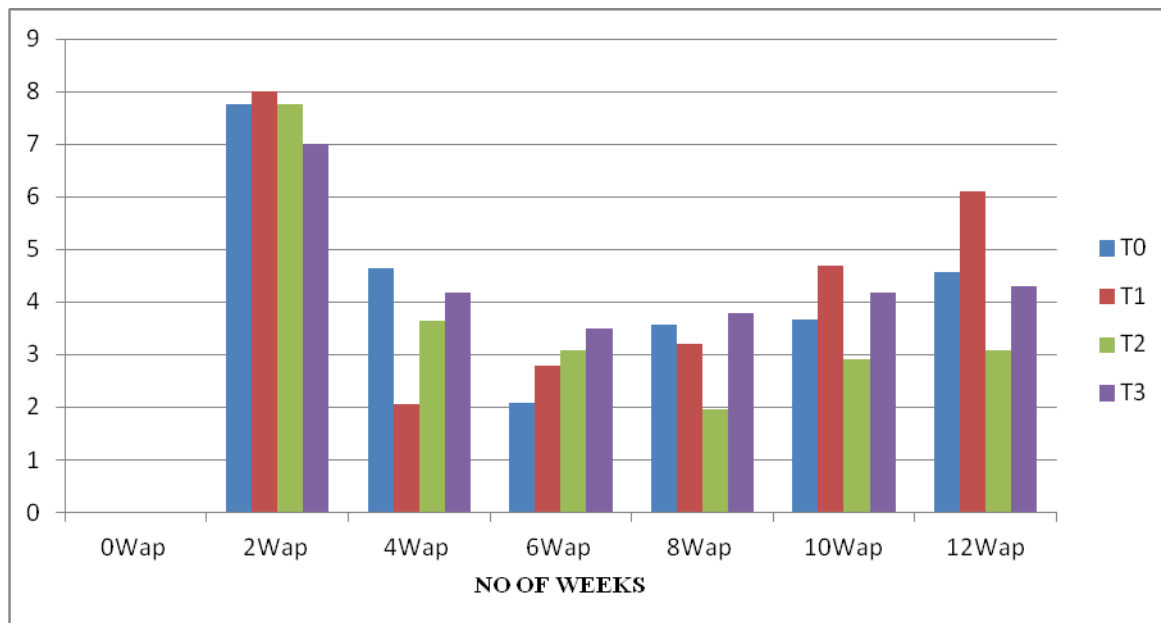


Figure 5: EFFECT OF ORGANIC MANURE ON LENGTH OF INTERNODE

The length of internode at 2wap, T₃ had the shortest internode length, followed by T₀ and T₂ while T₁ had longest internode length, while at 4wap, T₁ had the shortest internode length followed by T₂ while T₀ had the longest internode length while 6wap, T₀ had the shortest internode length with slight difference from T₁ and T₃ had the longest length of internode and 8wap, T₂ had the shortest length of internode while T₃ had the longest, while 10wap, T₂ had the shortest internode length and T₁ had the longest and finally at 12wap T₂ had the shortest length of internode while T₁ had the longest.

Although the least significant different (LSD) procedure shows that there was no significant difference among treatments.

Interaction Effect of Treatment by Weeks on Plant

Leaves

The result on number of leaves shows that plant treated with T₃ i.e. cassava peel compost performed best with highest number of leaves followed by plant treated with T₁ (Sunshine organic) and followed by plants not treated with any manure i.e. control and the plant which is treated with T₂ (Tithonia manure) had the least performance in number of leaves. The result of number of leaves viz-a-viz cassava peel compost is justified by Akanbi *et al.* (2011) where growth and nutritional quality assessments were done on number of leaves, leaf area, dry matter and shoot yields, shoot proximate and elemental contents for *Celosia* vegetable. It could be concluded that the use of cassava peel compost is appropriate for *Ixora coccinea* production.

Branches

Ixora plants treated with T₃ i.e. cassava peel compost have greater number of branches right from 2 weeks after planting till when the experiment was actually terminated at 12 weeks followed by the plant treated with T₁ (Sunshine organic, T₂ (Tithonia manure) respectively while the control treatment grew with the least number of branches from the interactive table. The result of no of branches viz – a – viz cassava peel compost is justified by (Aremu *et al.*, 2011) where the vegetative trait of *Telfaria* plants were significantly affected by the different fertilizer regimes (cassava peel compost and pacesetter). The selling height at two weeks after transplanting was significant following the different fertilizer levels.

Internode

The branches did not emerge until 2 weeks after propagation. Plants treated with cassava peel compost had the longest internode length, whereas the internode length difference was not pronounced in the other treatments. The result of length of internode viz – a – viz cassava peel compost is justified by (Raymond, *et al.* (1985) where cassava peel compost and other organic manures were applied to *Passiflora*.spp (passion flower) and the plant with cassava peel compost had the longest of internode.

Height

Plants with no treatment and sunshine organic manure had the least number of height recorded followed by the plant treated with *Tithonia* manure. Cassava peel compost had the highest plant height recorded. Though, all the treatments were not statistically significantly different, one with the highest response in terms of plant height is that treated with T₃ i.e. cassava peel compost. The result of plant height viz – a – viz cassava peel compost is justified by (Ojetayo and Olaniyi, 2011) where the highest growth parameters (plant height) were obtained from plant that received cassava peel compost in the determination of the effect of fertilizer types on the growth and yield of two cabbage types.

Summary, Conclusion And Recommendation

The consideration of cost of procuring organic manures in treating flowering plants on large scale floriculture concern may justify the choice of organic manure rather than looking at types. The highest luxuriant physical performance was actually recorded from cassava peel compost. In the use of organic manures, it is as far as this research is concerned recommended that cassava peel compost be embraced wherever the raw material is abundantly available for floriculture farming of Ixora flower. There is however the need to replicate this research in other parts of the globe so as to be sure of the efficacy of our findings.

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