iJRASET
International Journal For Research in Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 9 **Issue:** XI **Month of publication:** November 2021

DOI: https://doi.org/10.22214/ijraset.2021.38851

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International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.429
Volume 9 Issue XI Nov 2021- Available at www.ijraset.com

Regeneration of Dead Bougainvillea Tree with Organic Manure

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Abstract: ***Bougainvillea is hard, woody climber tree, grow in high salt tolerant soil. The present study was carried out in regenerating Bougainvillea plant with organic manure. The research work was conducted at kitchen garden campus in January 2020. The collected soil samples of five trees species namely Pimple, Neem, Khejari and Rohira are mixed with 10kg fresh cow dung, 5kg cow urine, 2kg molasses & 2kg flour Kitchen wastes 10kg, Charcoal 10kg, Molasses 2kg, Rice 1kg, Humus 10kg, Wheat 10kg, Crashed sugar cane 10kg, Chicken manures 2kg, Wooden saw dust, Wooden chips & Rice lusts and mixed with water for preparing organic product. The organic product keeps for 3 days in open conditions. The prepared organic product was poured into the shoot and root. Later, the regrowth of the shoot and the root were reported in 4-5 months. The organic product enhanced the metabolism for regenerating permanent tissue and Meristematic tissue of Shoot horizon and root horizon. Later, The lateral branches and flower were emerged from the dead plant. The formulated organic product is competent to regrow dead plant.***

Keywords: Bougainvillea, Dead plant, organic manure, regeneration, soil, climate

Novelty

1) ***Regeneration of the dead plant in 4-5 months,***
2) ***Development of standard organic product with organic manure, plant waste materials and soils of tree species.***

I. INTRODUCTION

Bougainvillea is hard, woody shrub and climber tree, grows mainly in tropical and sub-tropical climate, propagates through cuttings. It is originated from South America, cultivates in high salt tolerant soil and belongs to Nyctinaginacea family (Kent *et al*., 2007). The economic part of the plant is flower that imposes in controlling diabetes, curing of cough, curing threat inflammation, removing toxic chemical from the body through tea consumption, relieving from joint pain & swollen joint, curing from the fever (Zahidul *et al*., 2016). Organic manure is nutrient enriched natural materials that apply for soil and crop improvement. It contains mineral nutrients N, P, K that reforms soil physical property and chemical property. It recovers content of nutrient deficiency and physiology of the plant. It naturally balances ecology and ecosystem of the biosphere. It as potential to reform dead plant, withered plant and wounded plant. The organic manure is prepared with the microbial decomposition. The microbes synthesizes nutrient in the decaying matter through biogeochemical cycle. Microbes can make nutrients and minerals in the soil available to plants or tree produce “hormones” that spur growth, stimulate the plant immune system. By contrast healthy-biological enrich soil can increases fertility in multiple ways, including supply of nutrients such as nitrogen and protecting against pests and diseases, while reducing the need of water and other inputs. An incredible diversity of organisms makes the soil food web. They range in size from the tiniest one called bacteria, algae, fungi and protozoa to more complex nematodes and micro arthropods the visible-earthworms, insects small vertebrates and plants. All these organisms eat grow and move through soil, they make it possible to clean water, clean air, healthy plants. Bacteria & Fungi are the decomposers. But bacteria are most nutrient dense living organisms on this planet and are also the primary decomposers or organic matter, without trees, we would be smothered in our own waste in a matter of months. They divide by single cell division, which is one cell divides and make two cells and so on. They can multiply faster than other micro-organisms like fungi protozoa and nematodes. Our nature has designed the soil food web in such a way that the main food sources for higher organisms have the highest reproduction rate. At 60 F, I grow communities of these unique soil micro-organisms and used directly in the soil of dead trees to balance the soils. Rebuild the soil food-web. Organic matter is the building block of the soil food-web. Ajisafe *et al*. (2019) concluded that organic manure contributes in the early growth and development of Bougainvillea species.

With this background, the following objectives were taken in the studies ie.,

1) To evaluate growth and development of the plant above the ground,
2) To evaluate growth and development of the plant below the ground,
3) Duration of regeneration of the Dead trees.

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II. MATERIALS AND METHODS

A. *Materials*

Soil samples of Pimple, Neem, Khejari and Rohira, 10kg fresh cow dung, 5kg cow urine, 2kg molasses & 2kg flours, Kitchen wastes 10kg, Charcoal 10kg, Molasses 2kg, Rice 1kg, Humus 10kg, Wheat 10kg, Crashed sugar cane 10kg, Chicken manures 2kg, Wooden saw dust, Wooden chips, Rice lusts, water.

1) *Place of Study:* Kitchen garden campus
2) *Month & Year of Study:* January, 2020
3) *Plant Used in the Study:* Dead Bougainvillea **(Fig. 1)**

B. *Methods*

1) Collection of different soil samples of different trees of five species namely Pimple, Neem, Khejari and Rohira.
2) 10kg fresh cow dung, 5kg cow urine, 2kg molasses & 2kg flour,
3) Kitchen wastes 10kg, Charcoal 10kg, Molasses 2kg, Rice 1kg, Humus 10kg, Wheat 10kg, Crashed sugar cane 10kg, Chicken manures 2kg, Wooden saw dust, Wooden chips & Rice lusts and mixed with water.

The collected soil samples are mixed with organic manure, plant residue and humus for preparing the organic product, keeps for 3 days in open conditions. The prepared organic product was poured into the shoot and root. Later, the regrowth of the shoot and the root were reported in 4-5 months.

III. RESULTS AND DISCUSSION

Soil microbial communities are primary drivers in ecological processes such as the nutrient and carbon cycling. It progresses physical properties of soil including its structure texture, water absorption capacity and root penetration, chemical fertility involves nutrient levels and presence of chemical conditions such as acidity, alkalinity and salinity that may harmful or toxic to the plant or tree. Each of these groups such as bacteria, Actinomycetes, fungi, algae, protozoa and viruses has different characteristics and different functions in the soil.

A. *Investigation of Growth and Development of the plant Above the Ground*

"Shoot Growth" shoots elongate or grow in height at the tips of branches. Apical meristems are located in the terminal buds at the tip of branches. Cells at the apical meristem divide elongate and differentiate in distinctly visible steps. But the at the apical meristem need oxygen. The buds at the tip of the branch open (2) Leaves emerge and enlarge (3) The area between the leaves expands i.e. the stem grows. Side lateral buds also grow in the same way but often these are dormant and do not grow until they are released after such activities as pruning.

B. *Investigation of Growth and Development of the Plant below the Ground*

Roots of tree can grow in length diameter and numbers. At the "tip of a root" is the root cap. This cap protects the root and must be constantly replaced as a root pushes through soil. Behind the root cap is meristem which produces-new cells for the root cup and for root elongation. More the oxygen available for the root caps-the more the new cells produces. These more new cells elongate, divide and differentiate into root parts as it pushes through the soil. More the oxygen available the more roots parts available for the grow of the roots and the growth of tree. Root can also grow new lateral roots that form and branch off the main root. Some cells which need oxygen-located in a layer inside new meristem divides and elongates pushing the root out through the parent root. The organic product provided oxygen and water in the permanent tissue and the Meristematic tissue that conducted roots and shoots regeneration. Krishan *et al*., (2020) described that application of manures progresses growth and development in the plant.

C. *Duration of Regeneration of the Dead trees*

The organic product was pasted in the shoots of the tree. The above mixture of soil biology designed with nature-the soil food web. The shoot and root tip/bud were initiated to regrow the dead tree with incorporation of organic product and metabolic activity. Once these buds sprouted, the tree started to regrow all the lost foliage and gradually recover time-within 4 months - 5 months period. The first few leaves sprouted from the apical buds may look very different to the leaves that were on the tree before it was burnt/dead. These few leaves are juvenile leaves and will soon be replaced by adult leaves **(Fig. 2).**

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IV. CONCLUSION

The organic manure has potential to regenerate the dead plants. It has efficiency to overcome nutrient content deficiency. It provides mineral nutrient, water, organic molecules for conduction metabolism and regenerating Permanent tissue and Meristematic tissue. Further, the standard materials and methods would be applied for preparing solid formulations and liquid formulations.

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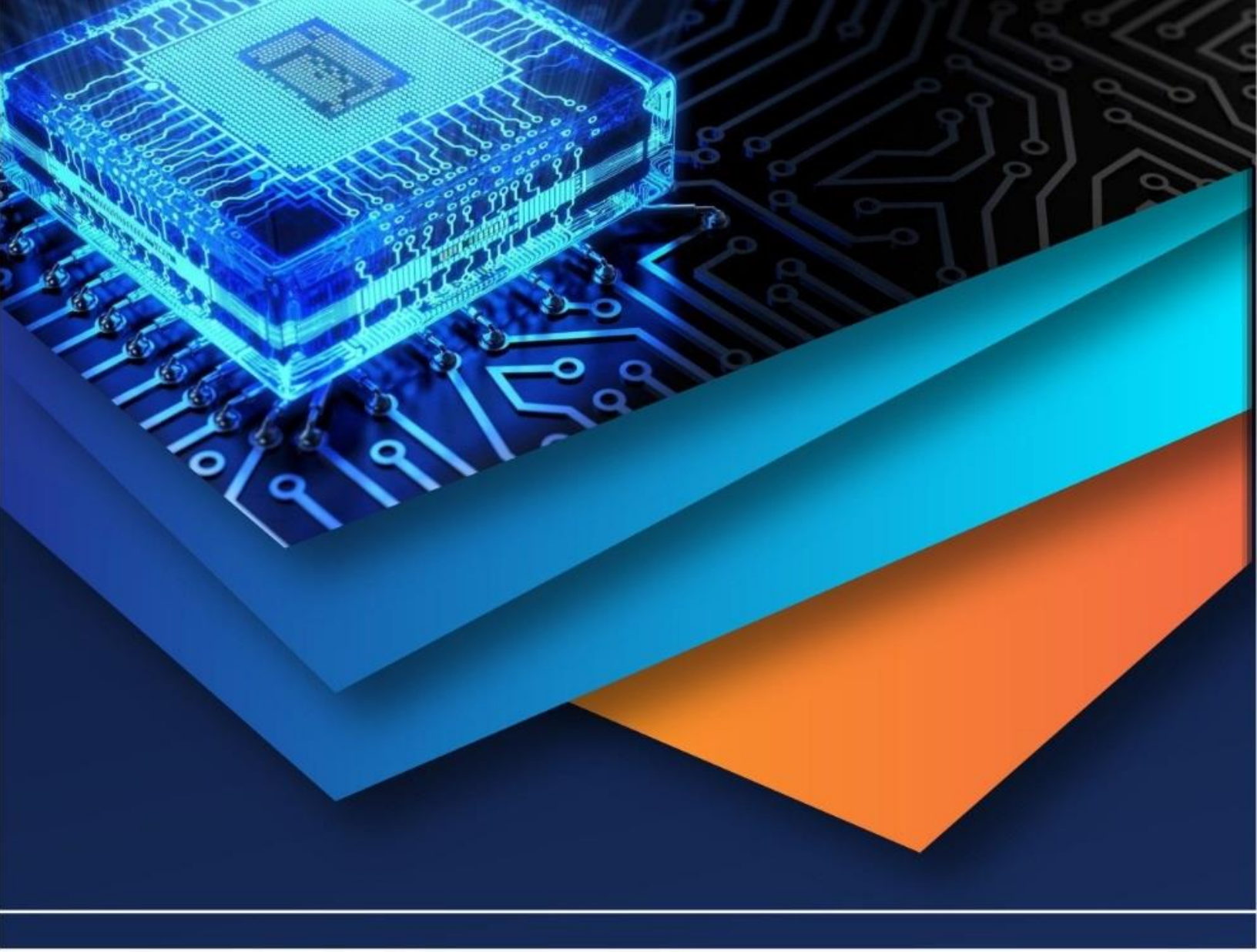
Fig. 1: A Dead tree of Bougainvillea



Fig. 2: Regeneration of Bougainvillea tree at 48 °C in summer, June 2020

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