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# COCO PEAT: A NEW ERA OF SOIL LESS URBAN FARMING

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**Abstract:**
Coconut palm is an important plantation crop grown in 1.89 million ha in India supporting livelihood of many Indians. Coir industry is the important cottage industry related to coconut palm. Coir processing factory in India produce approximately 0.5 million tones of coir pith waste every year. The coir waste accumulates and creates an environmental hazard. Coir waste from coir fiber industries is processed into coco peat then used for horticultural and agricultural applications. Coco peat being resistant to bacterial and fungal growth also has high moisture retention and cation exchange capacity. Coco peat with such useful properties is not recommended for agricultural use alone due to its high lignin and cellulose contents. But if it is used in combination with other compost and organic manure it can prove to be an excellent culture medium, plant nutrient source and soil substitute in modern agricultural practices. The objective of the present work is to evaluate the efficiency of coco peat as soil substitute and to assess its quality by addition of organic compost. The experiment was performed in three different stages in plastic containers covered with agro net in open condition. The two treatments were T1- coco peat alone, T2- coco peat + compost. The vegetable crops such as brinjal, tomato and leafy vegetables were selected for the experiment. Growth of crop includes height and number of fruits and leafy cover of leafy vegetables. The healthy growth i. e. 77.8 cm height and 122 numbers of fruits per plant in brinjal and 96 cm and 46 fruits per plant were observed. Leafy vegetables also showed excellent leafy cover in each container. The present investigation concludes that combination of coco peat with other compost makes it an excellent media for soil less culture of vegetable crops. Physiochemical properties of the substrate also play important role in determining the growth of vegetable crop.
Keywords: coco peat, Physiochemical, cation, compost, coconut

## Introduction

Coconut palm, grown in 1.89 million ha in India is an important plantation crop, supporting livelihood of many Indians **(George et al. 2013).** Coir industry is the important cottage industry related to coconut palm. Coir processing factory in India produce approximately 0.5 million tones of coir pith waste every year. The coir waste accumulates and creates an environmental hazard. Coir wastes of coir fiber industries is first washed, treated with heat, screened and graded. Then it is processed to form coco peat of different granularity and compactness, which are then used for horticultural and agricultural applications and also as an industrial absorbent.

Coco peat being resistant to bacterial and fungal growth also has high moisture retention capacity **(Evans et al. 1996)** and cation exchange capacity **(Mapa and Kumaru 1995**). It is also valued for high potassium content, low density and particle density. It has ability to store and release nutrient to plants for longer period. It shows oxygenation properties also.

Coco peat with such useful properties is not recommended for agricultural use alone due to its high lignin and cellulose contents. But if it is used in combination with other compost and organic manure it can prove to be an excellent culture medium, plant nutrient source and soil substitute in modern agricultural practices. Addition of cow dung manure and vermicompost provide high nitrogen, phosphorus and also Ca and Mg. Addition of Neem powder provides antimicrobial property to it.

The objective of the present work is to evaluate the efficiency of coco peat as soil substitute and to assess its quality by addition of organic compost.

## Methods:

Coco peat is also known as coir pith, made from coconut husk which are byproducts of coir industry. Coir waste from coir industry is processed into coco peat, which is then used for horticultural and agricultural application. Coco peat in combination with cow dung compost, vermicompost and Neem powder formed suitable media for soil substitute.

The experiment was performed in three different stages in plastic containers covered with agronet in open condition. The two treatments were T1- coco peat alone+ Neem powder(9:1), T2- coco peat + compost+ Neem Powder(6:3:1),

The vegetable crops such as brinjal, tomato and leafy vegetables were grown. Growth of crop includes height and number of fruits and leafy cover of leafy vegetables. Observations were taken after 65 days.

## Result and discussion:

The nutrients such as micro nutrients Ca and Mg and the macronutrients N, P and K were higher in compost mixed coco peat than coco peat alone. Water holding capacity, bulk density, pH, total organic (**Jackson 1973**), P, Ca, Mg **(Sundaram et. al. 2001**), N(**Van soest 1975**),K ( **JAOAC 1956**) of composted coco peat are given in table 1.

The total organic matters play an important role in growth and healthy development of **crop (Gonzalo 2009**). The amount of macro N, P, K and micro Mg, Ca nutrients was significantly higher in composted coco peat than coco peat alone **( Manual Abad et. al. 2005**) which led to healthy growth i. e. 77.8 cm height and 122 number of fruits per plant in brinjal and 96 cm and 46 fruits per plant was observed. Leafy vegetables also showed excellent leafy cover in each container.

Physiochemical characteristics of composted coco peat and coco peat alone were also studied by some worker in past **(Abhiramy et. al. 2012**). Present study also shows similar findings with their results except for few properties. The data from our experiment showed that although coco peat has several advantages still alone coco peat media is not found suitable for any crop. The same coco peat when mixed with compost showed better result in terms of height, number of fruits per plant (yield). Previous studies have also recommended the use of compost to promote better yield and growth.

**Table 1-** Physiochemical characters of coco peat and compost coco peat

| Parameters | Coco peat | Compost coco peat |
|---|---|---|
| Lignin (%) | 30.00 | 4.80 |
| Cellulose (%) | 26.52 | 10.10 |
| Organic Carbon (%) | 26.00 | 24.00 |
| Nitrogen(mg/kg) | 0.26 | 1024 |
| Phosphorus(mg/kg) | 0.01 | 0.06 |
| Potassium(mg/kg) | 0.78 | 1.28 |
| Ca(mg/kg) | 0.40 | 0.50 |
| Mg(mg/kg) | 0.36 | 0.48 |
| Water holding capacity (%) | 450.38 | 481.61 |

**Table 2-** comparison of two different substrates on crop growth.

| Growing substrate | Height of the plant | | | | Number of fruits per plant | |
|---|---|---|---|---|---|---|
| | 30 days | | 45 days | | 70 days | |
| Coco peat+ | Brinjal | Tomato | Brinjal | Tomato | Brinjal | Tomato |
| Neem powder(9:1) | 18 cm | 21 cm | 19 cm | 21 cm | 8 | 13 |
| Coco peat + compost + Neem powder(6:3:1) | 40 cm | 35 cm | 77.8 cm | 90 cm | 122 | 46 |

**Tomatoes**

**Brinjal**

**Amaranthus** **Tomatoes**

**Figure 1** Crop growth on Coco peat + compost+ Neem

## Conclusion:

The present investigation concludes that combination of coco peat with other compost makes it is an excellent media for culture of vegetable crops in soil less media. Physiochemical properties of the substrate also play important role in determining the growth of vegetable crop.

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