

Cocoponics: A New Soil less Culture

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SUMMARY

Green leafy vegetables are vital for growth and good health as they have plenty of vitamins, minerals and disease fighting chemicals. Urban farming has become increasingly popular in recent years, as more and more people are realizing the importance of locally sourced, sustainable food. However, growing plants in urban environments can be challenging due to limited space, soil quality, and other factors. That's where cocoponics comes in - a soil-less growing technique that uses coconut coir as a growing medium. The coir's fibrous structure allows for excellent water retention, making it an ideal medium for plant roots to access water and nutrients.

INTRODUCTION

In urban and peri-urban areas, soils are not apt for crop production. The application of soilless culture would allow to pass this constrain. An increasing attention in using soilless culture for the production of leafy vegetables in the outdoor and in polyhouse has developed in recent years. It looks that ensuing era of farming would be Hi-tech in hands of rich instead of traditional rural farmers and in high-rise buildings, not on soil but from soilless culture using Cocoponics, Hydroponics and Aquaponics. Nursery Entrepreneurs often face problems due to inadequate decomposition and heterogeneity of coir pith in terms of nutrient content. In order to overcome this, Arka Fermented Coco-peat has been developed by IIHR for vegetable seedling production. It developed the complete production technology including a liquid nutrient formulation (Arka Sasya Poshak Ras) for soilless cultivation of Zucchini, Color Cabbage, Chilli, Brinjal, Palak, Amaranthus, Coriander, Cucumber, French Bean, Peas, Cow Pea, Dolichos, Ridge Gourd, Bottle Gourd, Okra, Radish, Tomato and Exotic Leafy Vegetables viz., Lettuce, Parsley, Broccoli, Bok Choy etc. on Arka Fermented Cocopeat (substrate) under open as well as in protected conditions.



What is Cocoponics?

Cocoponics is a modern, soilless cultivation technique that uses coconut coir as a growing medium instead of traditional soil. This method allows plants to absorb nutrients more efficiently, leading to faster growth and higher yields. Cocoponics is a sustainable alternative to Hydroponics and other soilless methods, as coconut coir is an eco-friendly and renewable resource.

How Does Cocoponics Work?

Cocoponics works by utilising the natural properties of coconut coir, which is a byproduct of the coconut industry, as a growing medium. This medium is typically mixed with perlite, vermiculite, or other soilless additives to improve aeration and drainage. Plants grown in cocoponics systems receive their nutrients from specially formulated cocoponics nutrient solutions, which are regularly applied to the coconut coir. The coir's fibrous structure allows for excellent water retention, making it an ideal medium for plant roots to access water and nutrients.

Benefits of Cocoponics

Sustainability: Coconut coir is a renewable, biodegradable resource that can be reused multiple times, reducing the environmental impact of traditional soil-based gardening.

Efficiency: Cocoponics systems allow for faster nutrient uptake, resulting in quicker plant growth and higher yields compared to traditional soil-based methods.

Water Conservation: Due to the water retention properties of coconut coir, cocoponics systems require less water than soil-based gardens, conserving valuable resources.

Pest and Disease Resistance: Cocoponic gardens are less susceptible to pests and diseases, as the soilless environment offers fewer opportunities for pathogens to take hold.

Materials Required for AFC

Raw coir pith- 1 tonne, Aspergillus heteromorphus species-5 kg, Urea - 3.75 kg, One silpaulin bag (250 GSM thickness) measuring 12 x 4 x 2 feet, Carrier based Arka Microbial Consortium - 1 kg, Good Quality Water

Process

- Fix the silpaulin bag in a well drained area preferably under the shade of a tree along the slope of the ground so that the excess moisture drains out easily. If natural slope is not available create a slope to facilitate drainage
- Spread 100 kg of raw coir pith followed by 750 g of urea on top of it and moisten the surface with water
- Over this spread another 100 kg of raw coir pith followed by 1 kg of the carrier based fungal inoculum on top of it and moisten it well
- Repeat the process with alternate layers of urea and carrier based fungal inoculant, till the bag is full
- Maintain the moisture levels at around 70% by watering daily with good quality water. Make sure that excess moisture is not present and the drainage pores of the silpaulin bags are not clogged.
- At the end of 10 days fermentation period give a turning, to the entire material and reform the bed. Repeat the turning on the 20th and 30th days of the fermentation process.
- On completion of thirty days of fermentation process, the fermented material is enriched with 1 kg of Arka Microbial Consortium (N Fixing, P & Zn Solubilizing And Plant Growth Promoting Microbes).
- The enriched material is kept overnight for stabilization of the microbes, and can be used for raising vegetable seedlings in pro-trays from the thirtieth day onwards.

How to Do Cocoponics

Fill the grow bag with treated cocopeat manure and place seedlings or seeds directly into the cocopeat manure. Supply Arka Sasya Poshak Ras (The liquid nutrient formulation (comprising solutions A & B) unique balanced blend of the macro (N, P, K, Ca, Mg and S) and micro nutrients (Fe, Mn, Cu, Zn, B and Mo) which are required to support the growth of vegetables grown on cocopeat) at regular intervals through drip irrigation or through foliar spray as all are water soluble.

Market Potential:

Coco-peat prepared from coir pith a by-product of the coir industry is mainly used for raising of vegetable seedlings in pro-trays. Protray vegetable seedling production is increasingly becoming popular; hence the market potential for coco-peat is also expected to increase.

Investment Required:

To start a production unit of 1 tonne capacity per day an investment of approximately Rs.40,000 would be required to meet the non-recurring expenditure.

Crop Type	Solution A	Solution B	Frequency	Application
Nursery Seedlings	2.5 ml	2.5 ml	1 time per week	Drench / Spray
Vegetables	5 ml	5 ml	1 time per week	Drench / Drip 200 ml per plant
Leafy Greens	3.5 ml	3.5 ml	1 time per week	Drench / Drip 100 ml per pot / tray
House Plants	2.5 ml	2.5 ml	1 time per week	Drench 200 ml per plant
Fruit Plants & Trees	5 ml	5 ml	1 time per week	Drench / Drip 200 ml per plant

Dilution per lit of water

CONCLUSION

Considering the cost and maintenance of Hydroponic Unit, Cocoponics found to be best and low cost option for growing leafy vegetables for realizing better yield and profit. Therefore, Cocoponics can be widely adopted in terrace, balcony and roof top of urban, peri-urban and even in rural areas for meeting the daily requirement. Therefore, Cocoponics can be widely adopted in terrace, balcony and roof top of urban, peri-urban and even in rural areas for meeting the daily requirement

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