



Low Cost *in situ* Monsoon Vermicomposting with Rhinoceros Beetle Control Mechanism

Introduction

Before the introduction of vermicomposting in coconut garden the coconut leaves were widely used for thatching, broom preparation and as fuel. The petioles of the leaves were also used for fencing in Lakshadweep and other places where the availability of other source of tree material was rare (Plate-1 and 2). With the introduction of L P gas and easy availability of the house loans from bank, coconut leaves, a low cost material used for thatching and fencing are less in demand. In fact, in some areas farmers were under utter confusion as what to do with the fallen coconut leaves. Thanks to the *Eudrilus* sp. of earthworm, which can decompose the coconut leaves easily within a short period (2 to 3 months) depending on the management of the vermicomposting pit. Approximately 7 tonnes of coconut leaves are available



Plate 1. Petioles of leaves used for fencing at Lakshadweep Island



Plate 2. Fencing with coconut leaves



Plate 3. Earthworm *eudrilus* sp

from one hectare of well-maintained coconut garden. Leaf fall of coconut is found more during summer (i.e. preceding the rainy season) mainly due to the moisture stress. The coconut leaves left in the garden will be decomposed automatically, but at a slow pace because of the high wax, lignin and polyphenol contents. But the earthworms that live on organic matter, known as compost worms or manure worms can enhance the decomposition process. (Plate-3). *In situ* vermicomposting from coconut garden can meet N-69 per cent, P-71 per cent and K-38 per cent of the recommended nutrient requirement for one hectare of coconut garden. Since the organic manure obtained through vermicomposting from one ha are in bulk quantity, this cannot be accommodated in the basin area of 175 palms alone. By cultivating inter/mixed crops in coconut garden, the total quantity available from one hectare can be utilized effectively.

Low cost vermicomposting

Majority of coconut leaves fall during summer starting from January –February. These coconut leaves can be collected in the coconut garden itself. The lower portion of the petiole can be chopped off from the leaves before heaping for better accommodation of the leaves in the heap and better composting. Take the



height and breadth of the heap as 1 - 1.5 m. The length can be taken in any convenient size. Allow the leaves for natural curing till monsoon. When

Nylon fish net - a trap for Rhinoceros beetle

The size and the elasticity of the nylon net suits very much to act as a

emerges. This smell attracts the rhinoceros beetle to the heap and the beetle will try to enter into the compost forcibly through the covered net.



Plate 4. In situ vermicomposting in the inter space of coconut garden

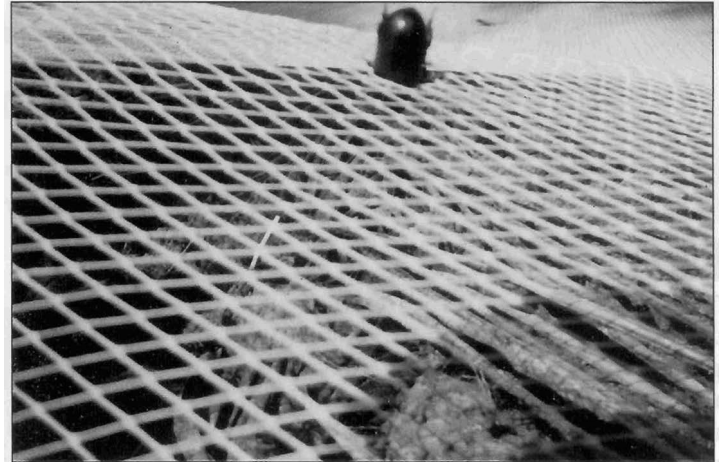


Plate 5. Cervix region of rhinoceros beetle is trapped in the fish net

monsoon is active, apply cow dung in different layers. i.e. for every 50 cm height uniformly to the full length and

trap for the beetle. As the material (coconut leaf and cow dung) starts decomposing, a smell of decomposition

However, the sector size(gap) of the net allows the beetle head to enter the net, it would not pass through the net as the body is large in size. So the thread of the net encircle the cervix region and holds the beetle in the inverted position till the beetle is attacked by crow or eaten away by ants. (Plate 5) Thus the nylon fishing net works as trap for rhinoceros beetle. This net works in two ways i.e. trapping the beetle and further breeding is stopped by the entrapped adult. Thus the rhinoceros beetle population gets reduced.

Vermicomposting in monsoon season	Vermicomposting in Other seasons
Less labour	More labour
Easy availability of leaves	Less availability of leaves
Cheaper cost of preparation i.e Rs 1.2 per kg	High cost of preparation - Rs 1.8 per kg
Care free except for initial care	Should be monitored daily
No necessity for watering and shade	Regular watering and shading is required
Traps rhinoceros beetle	Population of rhinoceros beetle increases if proper care is not taken
Recovery - 60 per cent	Recovery - more than 70 per cent
Composting time - 75 - 90 days	Composting time - 60 - 75 days

Advantage of the in situ vermicomposting

Vermicomposting in general needs a

breadth (the heaped leaves will be disturbed with the application of cow dung). While heaping the leaves, cow dung and earthworm can be applied simultaneously in different layers where the labour can be saved to some extent. After completing application of the cow dung and earthworms, the whole heap should be covered by nylon fish net (Plate-4) as a preventive measure to avoid breeding of rhinoceros beetle (the size of the gap in nylon net is 1 x 1 cm).

Economics for preparation of Vermicompost for one hectare of coconut garden

Items	Cost
Coconut leaves	Rs. 200
Nylon fishing net	Rs. 2000
Labour	Rs. 600
Cow dung	Rs. 200
Total	Rs. 3,000
Receipts	
Sale of Vermicompost	Rs. 12,000
Sale of earthworms	Rs. 4000
Total	16,000

Net profit Rs. 13,000/-ha in 3 months.

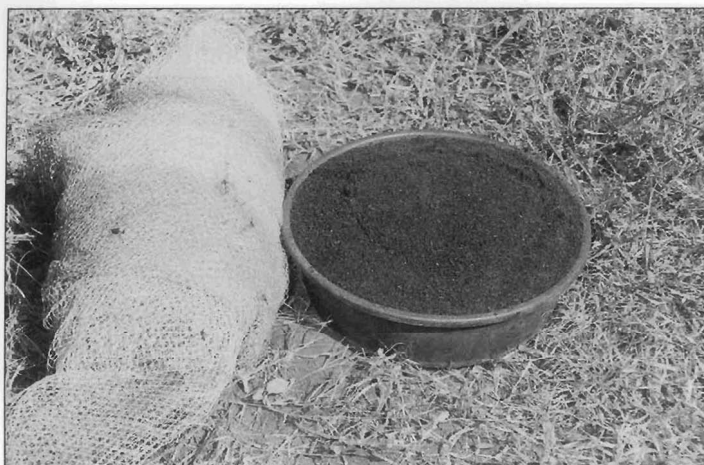


Plate 6. Sieved vermicompost is ready to sale

may serve as breeding site for the rhinoceros beetles. This problem can be solved by covering the heap with the net and the beetles are getting trapped in the net.

Economics

The raw material for vermicomposting ie the dried coconut leaves are available from

from one-hectare coconut garden. Also earthworms numbering between 4000 to 5000, which also add to the returns. The total cost of production comes to Rs. 3000/ha and gross profit obtained from sale of vermicompost and earthworm amounts to Rs. 16,000. Thus a net profit of Rs. 13,000 can be realized within a period of 3 months without taking much effort in terms of money, labour and time. (Plate 6)

Conclusion

This low cost *in situ* vermi-composting is not possible in all places where coconut is grown. However in Kerala and other heavy rainfall zones where rain and cloudy condition exists for a minimum period of two months, this monsoon vermicomposting is possible with less labour, money and time.

lot of care especially for shade and watering. The process of vermicomposting will not take place in dry condition. Since the composting takes place *in situ* in the inter space of coconut during rainy season both shade and water is available automatically. Since the heap is kept in shade during rainy season, it will not receive sunlight continuously and the composting pit

the garden and the composting is made in the garden itself no transportation cost is involved. The various items that add to the cost of production are the cost of the leaves, labour charges (for heaping of leaves and application of cow dung and earth worms) and cost of nylon net. The recovery percentage of vermicompost preparation was 60 per cent ie 2400 kg of vermicompost

R. Dhanapal*, V. Govinda Pai, C.Palaniswamy and P. Subramaniam
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